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25th Annual Report

Colorado River Storage Project and Participating Projects in Fiscal Year 1981

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Family fishes in Lake Powell side canyon

Flaming Gorge Dam as seen through the trees from 1 mile away

The Colorado River Storage Project (CRSP) is a basinwide program of development and use of water resources of the Upper Colorado River, and is one of the most complex and extensive river resources developments in the world.

It takes the drainage area of the Upper Colorado River Basin, encompassing parts of Wyoming, Utah, Colorado, Arizona, and New Mexico—about one-twelfth of the continental area of the United States. CRSP storage units (Glen Canyon Dam, Flaming Gorge Dam, Navajo Dam, and the Wayne N. Aspinall Unit dams) equalize the erratic flows of the Colorado River and its main tributaries so that water delivery commitments to the Lower Basin States—California, Arizona, and Nevada—can be met even in years of low flow.

The remaining water in the Upper Basin can then serve the needs of farmers, municipalities, and industries. Delivery of this water to consumers is accomplished through the participating projects.

Cover photo:
Scenic view of Flaming Gorge Dam, located on the Green River in northeastern Utah.

Contents

FY 81 in Review
Highlights 2
Construction Activities 4
Environmental Activities 8
Salinity Control Activities 9
Operations 10
Power Sales 12
Irrigation Operations 14
Recreation 16
Social and Cultural Resources 18
Fish and Wildlife 20

Financial Condition
Comparative Balance Sheet 22
Income and Expense Summary 24
Cash Receipts and Disposition 25

Allocation and Repayment
Allocation of Federal Investment 26
Estimated Project Costs 28
Estimated Project Costs by Purpose 29
Estimated Repayment of Federal Investment 30
Progress of Repayment 31
Rate of Repayment 32
Power Repayment Study 34

Map 36

Exhibit — Historical and Projected Repayment of Authorized Reimbursable Investment ..... Inside Back Cover

Fiscal Year 1981 Highlights

Aerial view of Red Fleet Dam and reservoir

Looking down the overflow spillway chute from the Jordan Aqueduct

Lyman Project: Stateline Dam and Reservoir filled June 1, 1981.

Central Utah Project: Jensen Unit — Filling of Red Fleet Dam began April 15, 1981, but was not completed due to low runoff. Block 1 drains were completed and turned over to operation and status. A contract was awarded for Tyzack Pumping Plant and Aqueduct, June 1981.

Bonneville Unit — A contract was awarded for Jordan Aqueduct Flow Control Structures, April 16, 1981; for Stillwater Tunnel backfill grouting, June 13, 1981; for grouting of Starvation Dam, March 26, 1981; for road repairs and paving of Rock Creek Road, September 15, 1981; and for rehabilitation of Pioneer Canal, August 20, 1981. Vat Tunnel holed through July 16, 1981. Currant Creek Pipeline was repaired.

Upalco Unit — A supplemental DPR was approved July 16, 1981. A repayment contract was executed August 27, 1981.

Dallas Creek Project: A supplement to the DPR to include power was prepared.

Dolores Project: A supplemental DPR to include powerplants as a project feature was approved June 18, 1981.

San Miguel Project: A concluding report was prepared.

West Divide Project: A concluding report was prepared.

Recreational and Fish and Wildlife Facilities: Campgrounds were completed at Stateline and Meeks Cabin Reservoir. Contracts were awarded for Habitat Improvement at the Green River below Fontenelle Dam; to develop Seedskadee National Wildlife Refuge; for Recreational Facilities of the Aspinall Unit; for construction of Red Fleet Recreation Area in June 1981; and for Recreational Facilities in the Navajo Dam Tailwater Area on September 29, 1981.

South end of Starvation Reservoir at bridge crossing.

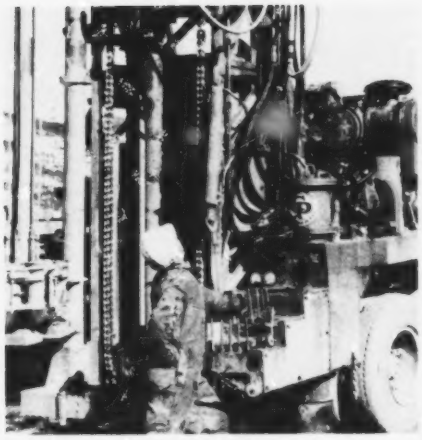
Reclamation employees contemplate a rainy project dedication.

Congressional Appropriations
Fiscal Year 1981

	Fiscal Year 1981	Total to Date
Appropriation for Construction		
Basin Fund	$123,543,000	$1,324,553,177
Recreational Fish and Wildlife	20,497,000	91,251,500
Subtotal	144,040,000	1,415,804,677
Transfers between Government Agencies		381,357
Appropriations to Original Paonia Project		2,081,773
Navajo Indian Irrigation Project	11,480,000	223,072,500
Total Congressional Appropriations	$155,520,000	$1,641,340,307

Construction Activities

The Currant Creek Pipeline is in background, left center.



Setting up drill rig on the Upper Stillwater.

The major construction activities of the Upper Colorado Regional Office in fiscal year 1981 are on the Bonneville Unit, Central Utah Project; Dolores Project, Dallas Creek Project, and the Colorado River Basin Salinity Control Project. Minor construction or rehabilitation was also in progress on the Jensen Unit of the Central Utah Project, Glen Canyon Unit, Flaming Gorge Unit, Seedskadee Project, and the Wayne N. Aspinall Unit of the Colorado River Storage Project.

Central Utah Project: Bonneville Unit — Work on the following features was completed in fiscal year 1981: Currant Creek pipeline repair; Stillwater Tunnel backfill grouting; Strawberry and Currant Creek Recreation Roads; Exploratory Drilling, Fifth Water Powerplant; Work Center building, Currant Creek Recreation Area; Exploratory Drilling, Monks Hollow Damsite, Soldier Creek Sewage Lagoons, Strawberry Reservoir Recreation Area; Concrete test placement, Upper Stillwater Dam; Water Hollow Bridge and Exploratory Drilling, Fifth water Reservoir Area and Discharge Tunnel.

Work continued on the following in 1981: Vat Tunnel; Vat Diversion Dam and West Fork Pipeline; Jordan Aqueduct, Reach 3; Hades and Rhodes Tunnel and Appurtenant Structures; Holing through at inlet of Rhodes Tunnel in November 1980; Soldier Creek and Aspen Grove Recreation Areas; Strawberry Bay and East Side Recreation Roads; and Exploratory Drilling, Jordanelle Dam and Reservoir

Construction Costs — Annual and Accumulated

	Annual	Accumulated
Fiscal year 1972	$ 43,187,756	
To date as of June 30, 1972		$ 928,233,015
Fiscal year 1973	46,588,918	
To date as of June 30, 1973		974,821,933
Fiscal year 1974	36,986,459	
To date as of June 30, 1974		1,011,808,392
Fiscal year 1975	52,303,718	
To date as of June 30, 1975		1,064,112,110
Fiscal year 1976	70,281,741	
To date as of June 30, 1976		1,134,393,851
Transitional quarter and fiscal year 1977	131,750,705	
To date as of September 30, 1977		1,266,144,556
Fiscal year 1978	89,001,375	
To date as of September 30, 1978		1,355,145,931
Fiscal Year 1979	95,067,380	
To date as of September 30, 1979		1,450,213,311
Fiscal Year 1980	130,357,851	
To date as of September 30, 1980		1,580,571,162
Fiscal Year 1981	166,678,707	
To date as of September 30, 1981		1,747,249,869

Age no barrier to Soldier Creek fishermen.

Looking west into Hades Inlet Portal, Duchesne River Valley.

site. A contract for completion of Stillwater Tunnel is under negotiation.

Contracts were awarded for the following work: Jordan Aqueduct Flow Control Structures and Reach 3 completion; Remedial grouting, Exploratory Drilling, Jordanelle Damsite, Starvation Dam; Exploratory Drilling, Wasatch Aqueduct Tunnel portals; Rock Creek Road repair and paving, Pioneer Canal Rehabilitation; Stillwater Tunnel inlet repair; and Strawberry Bay Recreation Facilities.

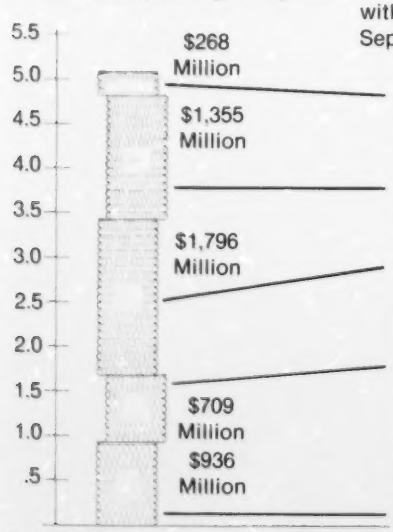
Jensen Unit — The block number 1 drains were completed. Contracts were awarded for the Red Fleet Campground and the Tyzack Pumping Plant and Aqueduct.

Dolores Project: Work continues on McPhee Dam, the major feature of the Dolores Project. Construction progress is ahead of schedule. The contractor continued work on the cut-off trench, grouting, selective level outlet works, river outlet works, spillways, and stilling basins. About 50 percent of the work was complete by the end of the fiscal year. A contract for upgrading and paving the McPhee Access Road and surfacing the Dolores Field Station was awarded September 9, 1981.

Dallas Creek Project: During the past year the contractor on Ridgway Dam Stage One continued work on the cut-off trench, grout curtain, outlet work, and spillway stilling basin. Work was initiated on the embankment. A contract for completion of the Ridgway Dam should be awarded in late fiscal year 1982.

Estimated Construction Costs of Colorado River Storage Project and Participating Projects

(Section 5 and Section 8 Facilities) with increases from 1956 (Initial) to September 1981 (Estimated)



Additional Section 8 Costs

Other Cost Changes

(Changes in Plan, Reanalysis of Quantities and Unit Prices, Legislative Additions, Unforeseen Conditions, etc.)

Cost Increases Due To Inflation

Subsequent New Authorizations

1963: Navajo Indian Irrigation Project, San Juan-Chama
1965: Bostwick Park, Fruitland Mesa, Savery-Pot Hook
1968: Animas-LaPlata, Dallas Creek, Dolores, San Miguel, West Divide, Uintah Unit-CUP

Initial Authorizations[1] (1956)

Storate Units: Aspinall (Curecanti), Flaming Gorge, Glen Canyon, Navajo
Participating Projects: Florida, Paonia, Silt, Smith Fork, Hammond, Central Utah, Emery County, Lyman, Seedskadee, La Barge[2], Pine River Extension[3]

[1]Only $760 Million was initially appropriated by Congress
[2]Deferred indefinitely in 1962
[3]Deauthorized in 1971

Lining the Highline Canal, Grand Valley, Stage One.

New boat launch facility at Red Fleet Dam.

Colorado River Storage Project: Glen Canyon Unit — The contract for the rehabilitation of the Glen Canyon service road tunnel was awarded in September 1980 for about $4 million. The work was approximately 80 percent complete by September 30, 1981.

A contract was awarded in September 1981 for exploratory drilling for the Glen Canyon Peaking Power Studies. The purpose of the study was to determine the feasibility of increasing the peaking power capacity at Glen Canyon Powerplant by 250 megawatts by adding two additional generators to the outlet works and the related impacts of such an increase in peaking capacity. The study was concluded in October 1981, although drilling activities will be finalized for any potential future use.

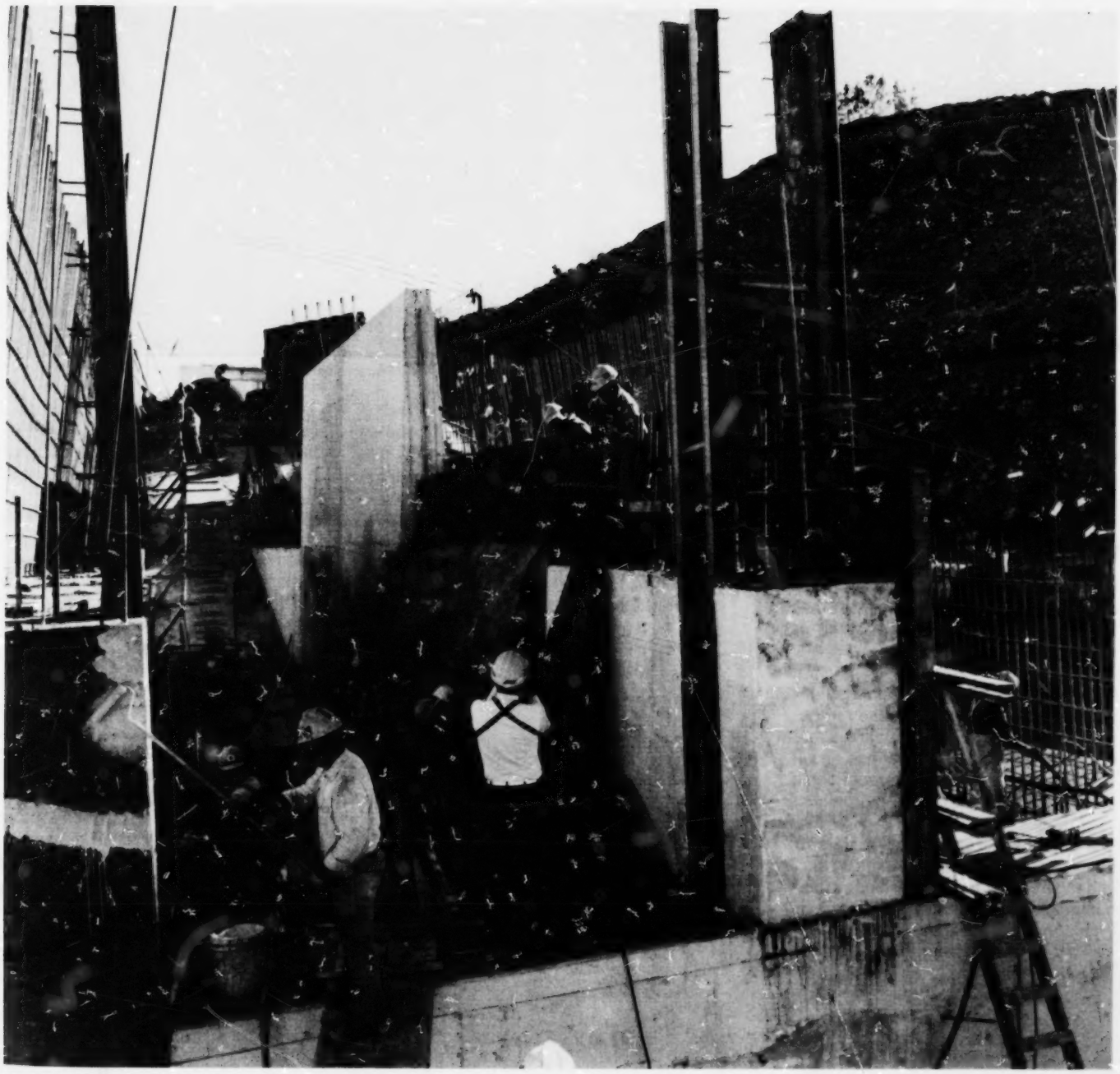
Flaming Gorge Unit — The Dutch John water system enlargement was completed in 1981. Work on the spillway outlet tunnel was terminated in 1981 due to substantially more repair than was anticipated. A new contract has been awarded to make these additional repairs.

Wayne N. Aspinall Unit — A contract for construction of a Day Use Facility, Road work, and Utilities, Wayne N. Aspinall Recreation Area, was awarded in March 1981. By the end of the fiscal year, about 60 percent of the $4,103,198 project had been completed.

Colorado River Basin Salinity Control Project: Grand Valley Unit — The contract for lining and rehabilitation of a 6.8-mile section of the Government Highline Canal under Stage One was completed. Water was delivered on April 2, 1981. On September 15, 1981, a contract was awarded to ITL Company, Denver, to place laterals in the Stage One area. A contract for the Grand Valley Field Station was completed in 1981.

Lyman Project: Work was completed on the recreational facilities at Meeks Cabin and Stateline Dams. Work on the stabilization of the cut slope above the Stateline Dam spillway stilling basin was accomplished.

Seedskadee Project: Contracts were awarded to repair the Fontenelle Dam River outlet works stilling basin and powerplant tailrace, and also to paint the surge tank.



Working on Ridgway Dam river outlet works stilling basin

National Environmental Policy Act Activities

Youthful fishermen at Strawberry Reservoir

Watering peach tree with Reclamation water

No Environmental Statements were completed, but those being prepared for the Lower Gunnison Basin Unit and the Dominguez Project are on schedule. Also, seven Environmental Assessments, seven Findings of No Significant Impact, and 62 Categorical Exclusions were prepared.

Work is continuing on the implementation of the Instream Flow Agreement for the Strawberry Collection System which was signed in February 1980.

Significant baseline environmental studies continued at Utah Lake for the proposed Irrigation and Drainage System of the Bonneville Unit. Other fish and wildlife baseline inventories were conducted at CRSP participating projects.

The Colorado River Fishery Program to determine habitat requirements of the endangered Colorado River Squawfish, humpback chub, and bonytail chub continued through fiscal year 1980.

Salinity Control Activities

Briny deposits along Dolores River in Paradox Valley

Progress is continuing on three of the four units authorized by the Colorado River Basin Salinity Control Act (Public Law 93-320, June 24, 1974).

On the Grand Valley Unit, the field station has been completed, 6.8 miles of the Government Highline Canal have been concrete-lined, and construction to place the laterals in pipe is in progress. These activities are all confined to the Stage One Area.

On the Paradox Valley Unit, a contract has been awarded to study the feasibility of brine disposal by deep-well injection. The second phase of the contract to design an injection test well is nearing completion. A second contract to construct and test the injection well will be initiated in fiscal year 1982. Testing the well field is continuing.

La Verkin Springs issues into the Virgin River

On the Las Vegas Wash Unit, a status report is nearing completion which will give an evaluation of the data that has been collected. Two studies presently in progress are (1) a verification program to monitor the decrease in ground-water flows that would result from stopping seepage in surface water ditches; and (2) a comprehensive waste water plan is being developed for the Lower Las Vegas Valley.

The Crystal Geyser Unit has been deferred.

Concrete-lined Government Highline Canal, Colorado

Public Law 96-375 was enacted on October 3, 1980, authorizing feasibility studies on 10 salinity control units in addition to the four authorized. These are the Lower Gunnison Basin, Glenwood-Dotsero Springs, Meeker Dome, McElmo Creek, Uinta Basin, Dirty Devil River, Price-San Rafael Rivers, La Verkin Springs, Lower Virgin River, and Big Sandy River. The feasibility studies for eight of the units are in various stages of completion. Studies on the La Verkin Springs and Lower Virgin River Units ended in concluding reports.

Operations

Blue Mesa Dam, of the Aspinall Unit, completed in 1965

Flaming Gorge Selective Withdrawal Structures

Morrow Point — first thin-arch, double curvature dam

Reservoirs

During the water year which ended September 30, 1981, the Upper Colorado River Basin yielded 5,556,000 acre-feet, or 46 percent of the long-time average.

Runoff on the Colorado River above Glen Canyon Dam was the third lowest on record (since 1906). The disposition of this runoff was as follows:

	Acre-feet
Net reservoir storage decrease	3,205,000
Evaporation loss	686,000
Bank storage decrease	220,000
Release to lower basin	8,295,000
Total yield	5,556,000

Water storage at Glen Canyon decreased by 2,328,000 acre-feet from October 1980 to September 1981. Flaming Gorge storage decreased by 160,000 acre-feet, and Navajo and Blue Mesa storages decreased by 308,000 and 362,000 acre-feet, respectively. Fontenelle Reservoir in Wyoming missed filling by only 2,000 acre-feet and storage decreased by 53,000 acre-feet. Morrow Point and Crystal Reservoirs were operated at full capacity nearly the entire water year.

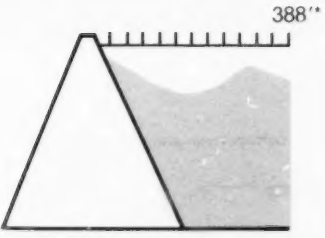
Rivers

Lower releases from Glen Canyon Dam during March, April, May, and June allowed the Western Area Power Administration to integrate purchased power into the Colorado River Storage Project system when it was readily available.

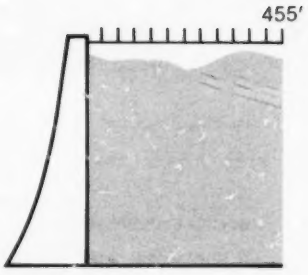
Minimum releases from Glen Canyon Dam were maintained greater than 3,000 ft. ³/s during the recreation season and greater than 1,000 ft. ³/s during the remainder of the year. Flows in the Green River below Flaming Gorge Dam were maintained greater than 800 ft.³/s. Gunnison River flows below the diversion to the Gunnison River Tunnel were maintained greater than 200 ft. ³/s. Flows below Fontenelle Dam were regulated to meet irrigation, fish and wildlife requirements, and power demands. San Juan River flows below Navajo Dam were regulated to meet irrigation and fish and wildlife requirements. Minimum releases from Navajo Dam were maintained at 530 ft. ³/s during March, April, May, and June for fishery enhancement on the San Juan River.

OCTOBER 1980 — SEPTEMBER 1981

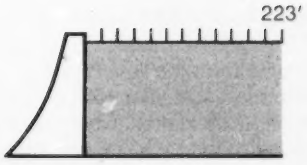
*Maximum height of water above streambed
**Acre-feet



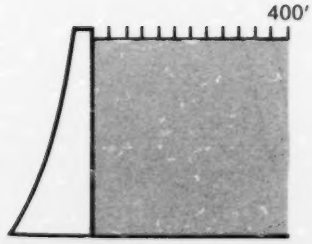
Navajo
Max. Storage — 1,709,000 AF**
Storage on September 30, 1981 — 1,260,600 AF



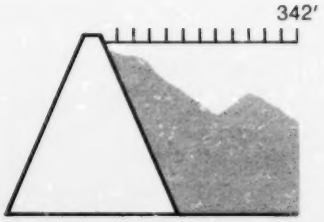
Flaming Gorge
Max. Storage — 3,789,000 AF
Storage on September 30, 1981 — 2,956,700 AF



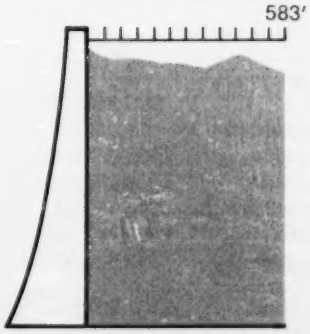
Crystal
Max. Storage — 26,000 AF
Storage on September 30, 1981 — 25,200 AF



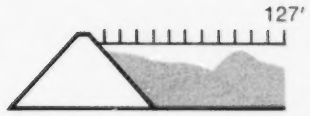
Morrow Point
Max. Storage — 177,000 AF
Storage on September 30, 1981 — 115,000 AF



Blue Mesa
Max. Storage — 941,000 AF
Storage on September 30, 1981 — 487,000 AF

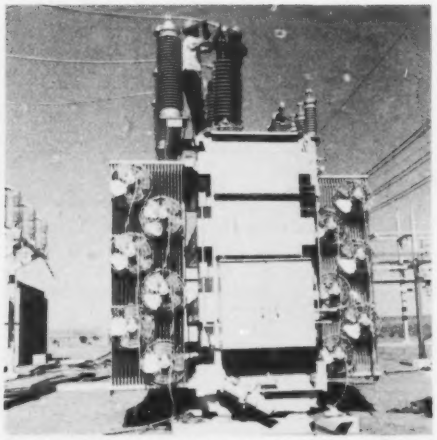


Glen Canyon
Max. Storage — 27,000,000 AF
Storage on September 30, 1981 — 22,749,000 AF

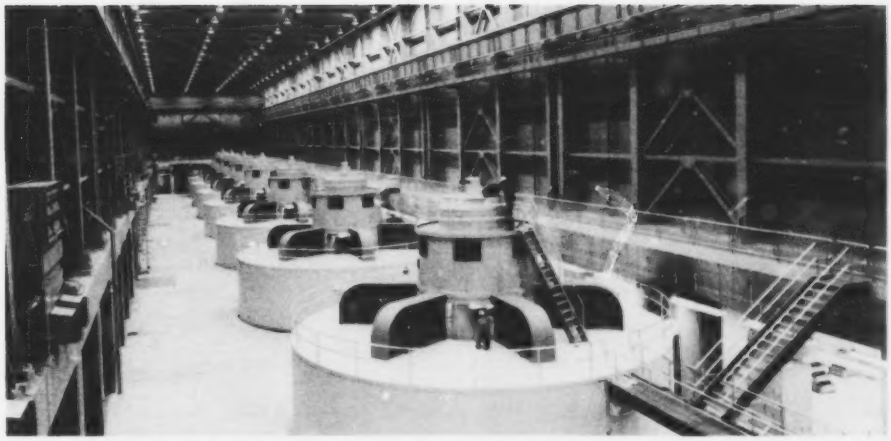


Fontenelle
Max. Storage — 345,000 AF
Storage on September 30, 1981 — 246,000 AF

Power Sales Income



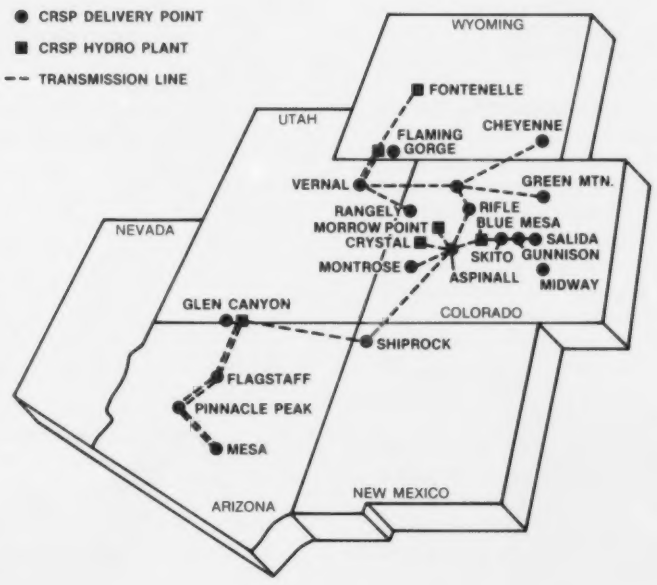
Transformer at Gallegos Substation, NIIP.



Glen Canyon's eight generators.

Fiscal Year 1981

Income from the sale of storage project power in fiscal year 1981 amounted to about $72.6 million, which was an increase of nearly $2 million from fiscal year 1981. In addition to normal generation and sales, the project purchased and resold 848,141,000 kWh (kilowatt-hours). Energy sales in fiscal year 1981 were nearly 6.5 billion kWh.



Fiscal Year 1981 Sales and Revenues by States

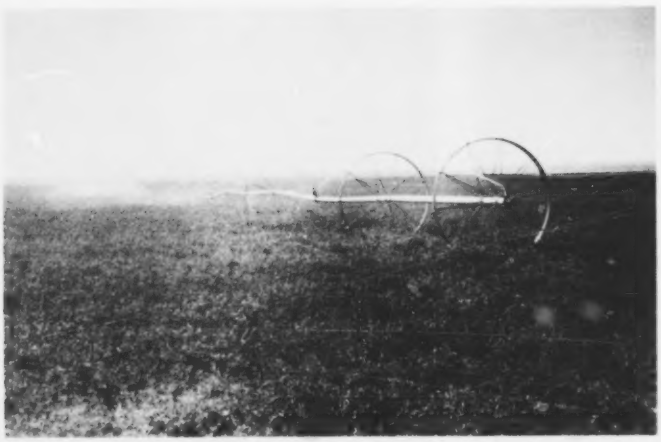
	kWh	Dollars
Arizona	900,314,000	$19,035,414
California	55,218,000	6,458,433
Colorado	1,588,080,000	13,407,412
Nevada	388,069,000	7,749,963
New Mexico	714,580,000	8,669,494
Utah	1,698,710,000	13,884,245
Wyoming	612,562,000	4,701,455
Total	6,467,533,000	$73,906,416

g Gorge Switchyard

Blue Mesa has two 30,000 kilowatt generators.

Source		Kilowatt-hours
Net Generation:		
Blue Mesa		245,512,000
Morrow Point		314,808,000
Flaming Gorge		360,789,000
Fontenelle		57,642,000
Glen Canyon		3,877,310,000
Crystal		169,604,000
Subtotal Generation		5,025,665,000
Purchases		1,690,653,000
Net Interchange		– 10,611,000
Transmission		222,038,000
Total Energy Available		6,927,745,000
Disposition	**Dollars**	**Kilowatt-hours**
Firm Energy Sales	$51,719,863	5,625,041,000
Nonfirm Energy Sales	22,186,553	842,512,000
Total Energy Sales	$73,906,416[1]	6,467,553,000
Mills per kWh		11.22
Deliveries to Hoover Allottees		0
(Hoover Deficiency)		0
System Losses		460,192,000
Total Distribution of Energy		6,927,745,000
[1]Total Energy Sales	$73,906,416	
Plus:		
Rent from Electric Property	462,109	
Wheeling For Others	1,984,336	
Miscellaneous Income	– 2,579,906	
	$73,772,955	

Irrigation Operations



Sideroll-type sprinklers water alfalfa

Setting plants in newly-irrigated soil

During the 1981 irrigation season, CRSP participating projects delivered 227,687 acre-feet of water. Total gross crop value from 129,393 acres of irrigated farm land was $19,255,749 equaling $2,047.29 per irrigated acre. The table shows irrigation figures by project for calendar year 1981.

State and project	Irrigable area for service (acres)	Area irrigated (acres)	Delivered to farms (acre-feet)	Gross crop values (dollars) 1981 Total	1981 Irrigated (Per acre)	To date Accumulated	First year
Colorado:							
Bostwick Park	5,180	3,428	9,150	644,525	188.02	6,742,965	1971
Florida	19,450	13,712	24,453	1,822,126	132.89	26,060,199	1964
Paonia	15,300	11,775	48,024	5,269,238	447.49	50,295,185	1951
Silt	7,044	5,390	16,604	1,152,020	213.73	10,633,846	1968
Smith Fork	9,479	8,924	12,764	881,738	98.81	13,266,446	1963
Utah:							
CUP							
Bonneville	26,046	18,787	33,156	3,376,313	179.72	25,498,714	1972
Vernal	14,700	13,848	20,900	2,151,290	155.35	25,778,338	1963
Emery County	14,170	12,820	16,153	2,412,716	188.20	22,711,158	1967
New Mexico:							
Hammond	3,933	2,795	15,016	1,042,720	373.07	10,099,010	1962
Wyoming:							
Lyman	42,674	37,914	31,467	2,654,353	70.01	12,380,136	1972
Total	157,976	129,393	227,687	19,255,749	2,047.29	203,465,997	

er irrigates newly-planted fields

Recreation

Opening day of fishing, Strawberry Reservoir

Sailing Navajo Lake

Operations: The Bureau of Reclamation administered recreation facilities at two Colorado River Storage Project reservoirs. Temporary facilities are administered at Soldier Creek Reservoir during the years the reservoir is filling. Construction of permanent recreation facilities began at Soldier Creek in 1979, and will continue through the completion of Phase I development. Soldier Creek is operated by the Utah Projects Office in Provo, Utah. Fontenelle Reservoir, of the Seedskadee Project in Wyoming, is administered by the Flaming Gorge Office in Dutch John, Utah.

Recreation Planning: Recreation planning for projects under feasibility investigations included the Dominguez Project, Glen Canyon and Flaming Gorge Peaking Power Project, and Diamond Fork of the Bonneville Unit, Central Utah Project.

Detailed site planning, design, and preparation of contract specifications continued on McPhee Reservoir, Dolores Project; Navajo Tailwater Area; Ridgway Reservoir, Dallas Project; and the enlarged Strawberry Reservoir and Red Fleet Reservoir, Central Utah Project.

Recreation Construction: During fiscal year 1981, construction of recreation facilities was initiated or completed at a number of storage units and participating projects.

Wayne N. Aspinall Unit, Colorado: Construction of recreation facilities continued at the Elk Creek, Iola, and Riverine area at Blue Mesa Reservoir. Camping, picnicking, and administrative facilities are under construction at Cimarron, Morrow Point Reservoir. Several trails and day use facilities have been completed at Morrow Point and Crystal Reservoirs.

Bostwick Park Project, Colorado: Construction of facilities continued at Silver Jack Reservoir with plans being made by the Forest Service for an August 1982 opening dedication.

Navajo Unit, New Mexico: A contract was awarded in September for the development of facilities in the Navajo Tailwater Area.

Central Utah Project, Utah: Bonneville Unit, Current Creek — Construction of recreational and administrative facilities was completed with the YACC program assisting in much of the development.

Bonneville Unit, Soldier Creek — Aspen Grove Campground was completed. All of the development at Soldier Creek site was completed with the exception of the tables, grills, shelters, barrier posts, etc.

Bonneville Unit, Strawberry — Work on the main access road and boat ramp was 46 percent complete. A new contract for construction of all circulatory roads, parking, structures, and utilities was awarded in September.

Jensen Unit, Red Fleet — A contract for paving of the main access road and construction of recreational facilities was awarded in June with one-half of the job completed by the end of the fiscal year.

Lyman Project, Utah and Wyoming: Campground construction was completed at both Stateline and Meeks Cabin Reservoirs. Both areas were opened to recreation use shortly after the 4th of July.

g opener crowds Soldier Creek facilities.

Filming at Lake Powell, come hell or

tations at Reservoirs

rvoir	Year First Visited	1977	1978	1979	1980	1981
all	1966	865,895	727,906	809,007	891,490	988,951
ford	1963	61,071	98,813	106,313	94,684	63,388
ng Gorge	1962	680,870	661,120	620,000	815,900	816,000
nelle	1965	50,901	83,784	65,049	48,668	42,560
n	1973	120,190	171,938	104,843	136,334	145,000
ngton North	1967	92,011	117,377	94,923	98,900	73,291
Valley	1967	137,150	115,200	91,950	82,773	104,080
Powell	1962	2,127,419	2,211,838	1,733,949	1,646,657	1,820,163
n	1964	96,615	93,113	45,390	44,897	66,129
s Cabin	1973	995	1,210	990	1,130	1,150
o	1963	486,743	427,512	312,671	335,464	401,351
a	1962	15,225	15,670	17,312	14,826	22,384
Gap	1967	105,776	138,275	157,612	147,773	148,206
Jack	1973	31,680	33,400	34,575	35,970	35,500
ation	1970	106,151	97,099	72,160	32,035	37,909
line	1981	—	—	—	—	Not opened
aker	1962	64,370	131,179	103,872	71,384	104,357
berry Enlargement		68,264	56,672	59,643	56,661	54,640
TOTALS		5,111,326	5,182,086	4,430,259	4,555,546	4,924,879

Social Resources

Rounding up cattle near Strawberry Reservoir

Reclamation water helps towns to grow

To preserve and enhance the quality of life through planning, construction, operation and management of the CRSP and participating projects, social assessment has become an integral part of the Bureau of Reclamation. Through an emphasis on planning, consideration of social effects begins early in project formulation.

In addition to the social effects of economic and employment opportunities provided through irrigation, power generation, and industrial water, the development of land and water for municipal, recreation, and fish and wildlife purposes also affects people in the project area. Preservation and enhancement of the affected population's social well-being are both emphasized in the social assessment process.

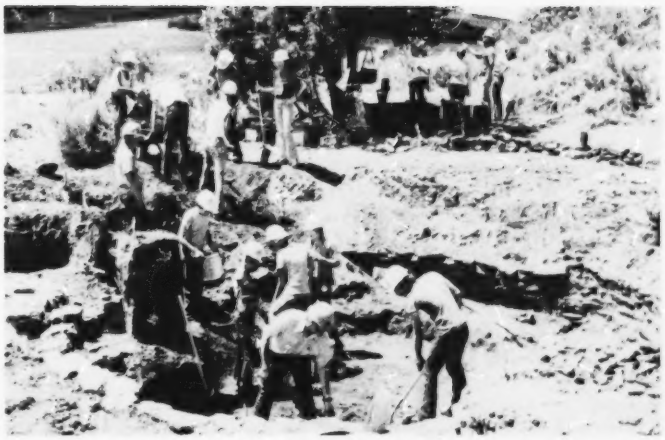
Major social, economic, and demographic studies of the Dominguez Project, Lower Gunnison Salinity Control Unit, and Blue Mesa Peaking Power were completed in fiscal year 1981. Studies of the San Miguel Project and the Glen Canyon Peaking Power investigation were terminated, while the McElmo Creek Salinity Control Unit, Glenwood-Dotsero Springs Salinity Control Unit, and Uinta Basin Water Services Improvement investigation were continued.

Major studies of the Central Utah Project, Bonneville Unit, Diamond Fork Power System were initiated. Many of these studies utilize the BREAM II computer model to place economic and demographic present and future conditions, with and without the proposed projects, into perspective. Subjective non-statistical effects are analyzed using mutually enhancing social assessment and public involvement techniques in all project investigations.

Although these studies are conducted by Regional and Project Office personnel, close coordination is maintained with the project area's affected population. Cooperation with State and local planners, demographers and researchers, particularly in Colorado and Utah, has proved a useful technique for avoiding duplication and enhancing the quality of both Reclamation and non-Reclamation studies. Meeting the project area's problems and needs is the basic purpose of this program.

ultural Resources

d archeology work at Dolores Project.



Excavating an Indian kiva on the Dolores Project

e Upper Colorado Region's cultural sources program is designed to provide anning and construction functions with e necessary cultural resources data to nimize the impact of Reclamation pro- ams on archeological and historical sources. In-house and contract surveys e conducted to locate, test, and evalu- e the resource base, and if necessary rough contract, data recovery is under- ken to mitigate major project impacts.

rvey and Evaluation

e locating and evaluation of the data se to be effected is critical to properly egrating cultural resources into the erall goals of the Bureau of Reclama- n. To facilitate these efforts, the region s archeologists located in the Grand nction, Durango, and Provo Project fices, and the Cortez Construction fice. These archeologists provide an in- use capability to conduct timely and st-effective cultural resources work as eded. The region is also divided into ree areas under Basic Ordering Agree- ents to cover those surveys which are o large or too time-consuming to be ne with Reclamation resources. The eas are the West Slope of Colorado, the Four Corners, and Central Utah Projects Area. During 1981, Reclamation conducted 48 cultural resources surveys throughout the region.

Mitigation

When required by the presence of significant resources in a project area, Reclamation undertakes Data Recovery Programs. In 1981, Reclamation concluded a 3-year program at the Dallas Creek Project. Ongoing, since 1978, is the Dolores Archeological Program (DAP). The DAP is an extensive data recovery program which by the end of 1983, will have excavated over 200 sites within the project boundaries. In conjunction with DAP, Reclamation is planning, and will construct the Anasazi Heritage Center to display to the public the artifacts recovered during the Dolores Archeological Program.

Fish and Wildlife

Two National Fish Hatcheries are performing important roles in the joint State-Federal approach to meeting fish stocking requirements at CRSP reservoirs.

1. Jones Hole National Fish Hatchery is located in a deep canyon on Jones Hole Creek near Dinosaur National Monument in northeastern Utah. In 1981, the hatchery produced 155,000 pounds of fish, which is about 70 percent of capacity. Total capacity with an improved access road is about 255,000 pounds.

2. Hotchkiss National Fish Hatchery is located on the north fork of the Gunnison River near Hotchkiss, Colo. Its output of 102,688 pounds of fish went principally for stocking requirements of Blue Mesa, Crawford, Lemon, and Silver Jack Reservoirs in Colorado; and Navajo Reservoir in Colorado and New Mexico. The increased production capability was due to completion of expansion of fish-rearing facilities at the Chipeta Unit of the Hatchery.

One National Wildlife Refuge and three waterfowl areas under State administration are now being developed.

1. Seedskadee National Wildlife Refuge lies along the Green River below Fontenelle Dam, Wyoming, and since 1966, has been administered by the Fish and Wildlife Service. Development and acquisition of private land holdings began at an accelerated scale during the year.

2. Brown's Park Waterfowl Management Area, under administration of the Utah Division of Wildlife Resources, is located below Flaming Gorge Reservoir on the Green River near the Utah-Colorado State line. The overall management area is attracting numerous resident and migratory game bird populations and is increasing in public popularity as a fishing, hunting, and bird-watching area.

3. Miller Mesa Waterfowl Area is on the west shore of the Navajo Reservoir just south of the Colorado-New Mexico State line. A small reservoir and two terraced ponds have been completed and filled. About 170 acres of agricultural lands have been planted with barley, oats, wheat, and alfalfa for wildlife management purposes. Waterfowl use patterns indicate that birds from other agricultural and nesting areas in the San Juan Valley are using the Miller Mesa site with increasing frequency.

4. Desert Lake Waterfowl Management Area comprises 2,480 acres of acquired and public domain land in eastern Utah near Huntington North Reservoir. Administered by the Utah Division of Wildlife Resources since January 1968, the area's contribution to waterfowl resources management was significantly increased by rehabilitation to the historic Desert Lake Dike and completion of five additional diked areas below the existing impoundment.

A number of measures have been initiated to mitigate fishery and big game losses caused by the construction of CRSP features:

Wayne N. Aspinall Unit, Colorado: Purchased 1,950 acres of land for big game mitigation.

Dallas Project, Colorado: Purchased 410 acres of big game range adjacent to Ridgway Reservoir. Provided for reimbursement of construction of 14.3 miles of deer-proof fence along Highway 550. Funded a terrestrial and aquatic wildlife monitoring study by the Colorado Division of Wildlife.

Dolores Project, Colorado: Purchased 2,045 acres of big game range for mitigation of the House Creek recreation development and reimbursed Section 5 funds for previous acquisition of mitigation lands.

Central Utah Project, Utah: Bonneville Unit — Completed acquisition of the largest acreage under single ownership (23,347 acres) ever acquired in the Upper Colorado Region.

Jensen Unit — Completed range rehabilitation measures on 500 acres of BLM range for wildlife mitigation.

Upalco Unit — Acquired fee title on 42 acres and wildlife easements on the remainder of the Yellowstone Ranch.

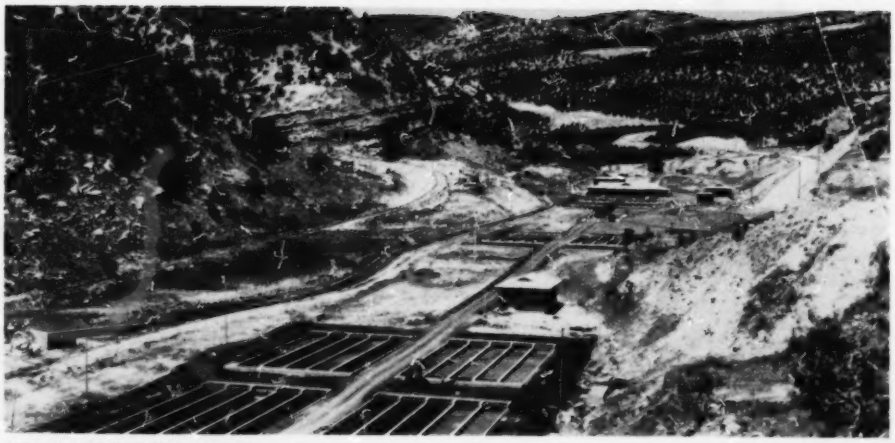
Flaming Gorge Unit, Utah: Purchased 2,305 acres of land for big game mitigation.

Lyman Project: Purchased 1,882 acres of land in Utah for mitigation of big game losses. Completed stabilization of Marsh Lake through transfer of storage to Stateline Reservoir.

Seedskadee Project: Purchased fee title to 160 acres and wildlife easements on 1,026 acres at Seedskadee National Wildlife Refuge. Awarded several contracts for fencing and development of the Refuge. Initiated 3-year habitat improvement program for the Green River Tailwater below Fontenelle Dam.

hery Statistics

ining security during fishery study

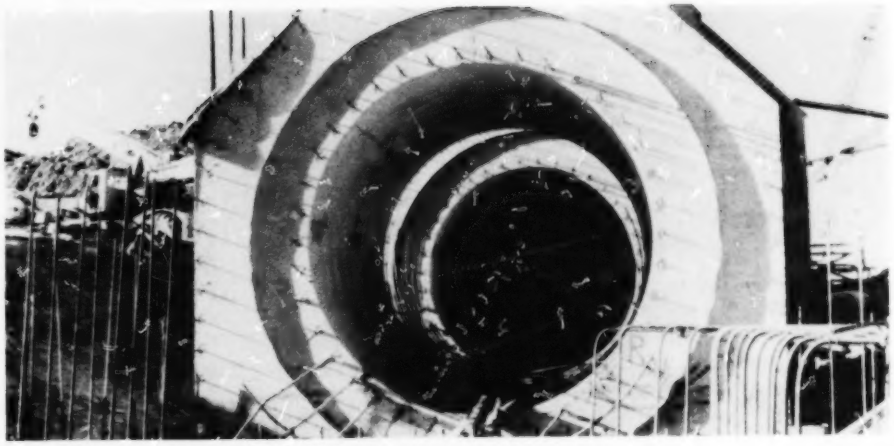


Jones Hole National Fish Hatchery

	1977	1978	1979	1980	1981
hall Unit					
rvoirs:					
sh Planted	1,366,000	1,042,000	1,750,919	1,539,370	2,399,000
sh Caught	255,000	150,000	No records kept	268,671	150,000
ing Gorge Unit					
rvoir:					
sh Planted	4,100,000	3,200,000	3,763,725	3,285,823	4,070,000
sh Caught	600,000	256,000	200,000	103,000	171,500
below dam:					
sh Caught — 10 mile	29,000	39,000	31,368	48,370	92,000
Canyon Unit					
rvoir:					
sh Planted	157,000	254,000	222,369	10,000	0
sh Caught	750,000	900,000	897,273	384,000	294,800
below dam:					
sh Caught — Lee's Ferry	7,500	10,000	9,500	No records kept	10,000
jo Unit					
rvoir:					
sh Planted	502,000	101,000	279,374	452,650	562,000
sh Caught	277,000	235,000	235,000	321,000	310,000
below dam:					
sh Caught - 6 mile	129,000	130,000	60,000	58,725	13,500
s					
rvoirs:					
sh Caught	6,125,000	4,597,000	6,016,387	5,341,843	7,031,000
sh Planted	1,882,000	1,537,000	1,332,273	1,077,611	926,300
below dam:					
sh Caught	165,500	179,000	100,868	107,095	115,500

Comparative Balance Sheet

Studying trout on the Green River



Looking downstream at conduit, Ridgway Dam

(Thousands of Dollars)

Assets and Other Debits	September 30, 1981	September 30, 1980	Increase or (Decrease)
Plant, Property, and Equipment	$ 581,383	$ 556,868	$ 24,515
Irrigation Plant	14,796	13,314	1,482
Electric Plant	365,217	364,675	542
M&I Water Plant	12,132	12,132	—0—
Fish and Wildlife Facilities	20,292	16,596	3,696
Public Recreation Facilities	25,284	21,018	4,266
Construction Work in Progress	674,786	553,415	121,371
Capitalized Movable Equipment	6,811	5,748	1,063
Other Physical Property	486	486	—0—
Service Facilities	2,759	2,587	172
Total Plant, Property, and Equipment	$1,703,946	$1,546,839	$157,107
Less: Accumulated Depreciation and Replacement	(25,188)	(22,687)	(2,501)
Net Plant, Property and Equipment	$1,678,758	$1,524,152	$154,606
Investigations	$ 19,769	$ 18,235	$ 1,534
Transitional Development	$ 5,393	$ 4,100	$ 1,293
Power Rights	$ 2,937	$ 2,481	$ 456
Investments	—	—	—
Current Assets			
Cash	$ 86,435	$ 63,071	$ 23,364
Deposit Funds	1,597	1,130	467
Accounts Receivable	16,863	18,015	(1,152)
Materials and Supplies	1,119	906	213
Prepayments and Advances	27,229	174	27,055
Total Current Assets	$ 133,243	$ 83,296	$ 49,947
Escrow Accounts	$ 5,537	$ 3,601	$ 1,936
Other Deferred Debits	28,003	23,782	4,221
Total Assets and Other Debits	$1,873,640	$1,659,647	$213,993

way of cleaning algae from evaporation pan

Hand-seeding right-of-way on Navajo project

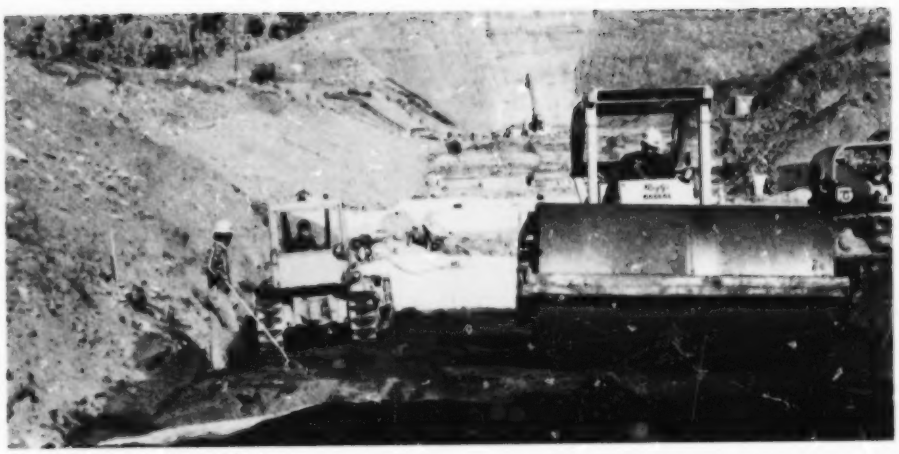
(Thousands of Dollars)

bilities and Other Credits	September 30, 1981	September 30, 1980	Increase or (Decrease)
stment of U.S. Government	$1,638,424	$1,482,904	$155,520
ongressional Appropriations	$1,638,424	$1,482,904	$155,520
terest During Construction Capitalized	92,622	82,699	9,923
ransfer of Property and Services	38,927	31,902	7,025
terest Accrued on Investments	189,500	177,472	12,028
Total Investment of U.S. Government	$1,959,473	$1,774,977	$184,496
ess: Funds Returned to U.S. Treasury	(321,445)	(302,599)	(18,846)
Less: Nonreimbursable Expense	(10,915)	(8,357)	(2,558)
Net Investment of U.S. Government	$1,627,113	$1,464,021	$163,092
n-Federal Investment			
lepayment Contract Matured	$ 4,898	$ 4,115	$ 783
Contributions	36,253	32,852	3,401
ess: Property Transfers to Water Users	(120)	(120)	—0—
Net Non-Federal Investment	$ 41,031	$ 36,847	$ 4,184
umulated Net Income	$ 114,185	$ 111,341	$ 2,844[a]
rent Liabilities			
ccounts Payable	$ 30,333	$ 16,432	$ 13,902
ther	1,642	1,140	502
Total Current Liabilities	$ 31,975	$ 17,572	$ 14,403
bility for Escrow Accounts	$ 5,537	$ 3,601	$ 1,936
er Deferred Credits	$ 53,799	$ 26,265	$ 27,534
al Liabilities and Other Credits	$1,873,640	$1,659,647	$213,993

crease in Accumulated Net Income of $2,844 represents $5,841 Income as per Fiscal Year 1981 Income and pense Summary and ($2,997) adjustments for prior periods.

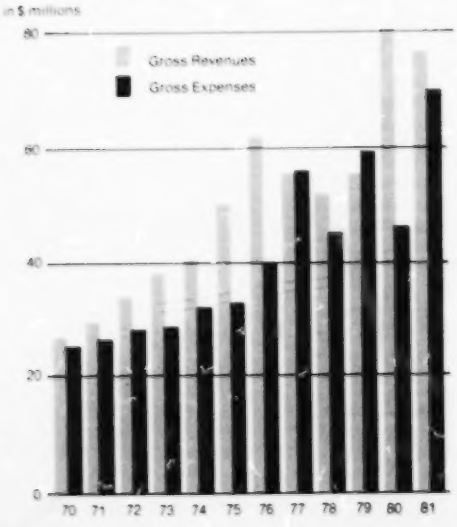
Income and Expense Summary

Close-up of test block area, Upper Stillwater



Compacting first lift at Ridgway Dam

Income and Expense



1981	Fiscal Year 1981	Fiscal Year 1980	Increase or (Decrease)
Gross Income			
Power	$73,837,416	$77,380,850	$ (3,543,434)
Irrigation	35,450	100,797	(65,347)
Municipal & Industrial (M&I)	1,260,385	1,545,740	(285,355)
Net Operating Income	254,182	221,094	33,088
Total Income	$75,387,433	$79,248,481	$ (3,861,048)
Deductions			
O&M Expense			
Power	$54,729,513	$31,812,184	$22,917,329
Irrigation	35,450	100,797	(65,347)
M&I	83,566	287,722	(204,156)
Depreciation and Replacement			
Power	2,527,665	1,687,138	840,527
M&I	1,576	1,426	150
Interest on Investment			
Power	11,693,161	12,191,476	(498,315)
M&I	475,497	479,988	(4,491)
Total Deductions	$69,546,428	$46,560,731	$22,985,697
Total Net Income (Loss)	$ 5,841,005	$32,687,750	$(26,846,745)

ash Receipts and Disposition

cing concrete in pump pedestal, NIIP

East up Hades Creek, note mud flows in foreground

unds returned to the Federal Treasury uring fiscal year 1981 amounted to 18,844,938. Payments on interest totaled 12,028,560 and $6,816,378 was applied n the principal.

ash receipts to date from all sources nd cash disposition are shown in the llowing tabulation. (This statement is on cash basis and amounts shown will not ecessarily coincide with other state- ents in this report which are presented n an accrual basis.)

	Fiscal Year 1981	Total to Date
Cash		
Total Cash Receipts	$79,958,783	$657,844,854
Disposition		
Quality of Water Expenditures'	171,663	1,421,400
Emergency Fund Expenditures	—0—	1,724,145
Consumptive Use Studies'	252,780	1,631,664
Utilized for Operations	45,552,614	299,846,214
Payments on Interest — Power	11,264,735	184,040,727
Payments on Interest — M&I Water	763,825	5,459,109
Payments on Investment — Power	5,144,578	119,938,226
Payments on Investment — M&I Water	1,408,140	9,370,785
Payments on Investment — Irrigation	263,660	2,615,228
Other Returns to U.S. Treasury	995	20,776
Retained for Operations	15,135,593	31,776,580
Total	79,958,783	657,844,854

'Although quality of water and consumptive use studies are financed from operating revenue the repayable debt of the storage project and participating projects is reduced an equal amount to compensate.

Allocation and Repayments

Excavating ditch on Emery County Project

Leveling rocks in gabion baskets, NIIP

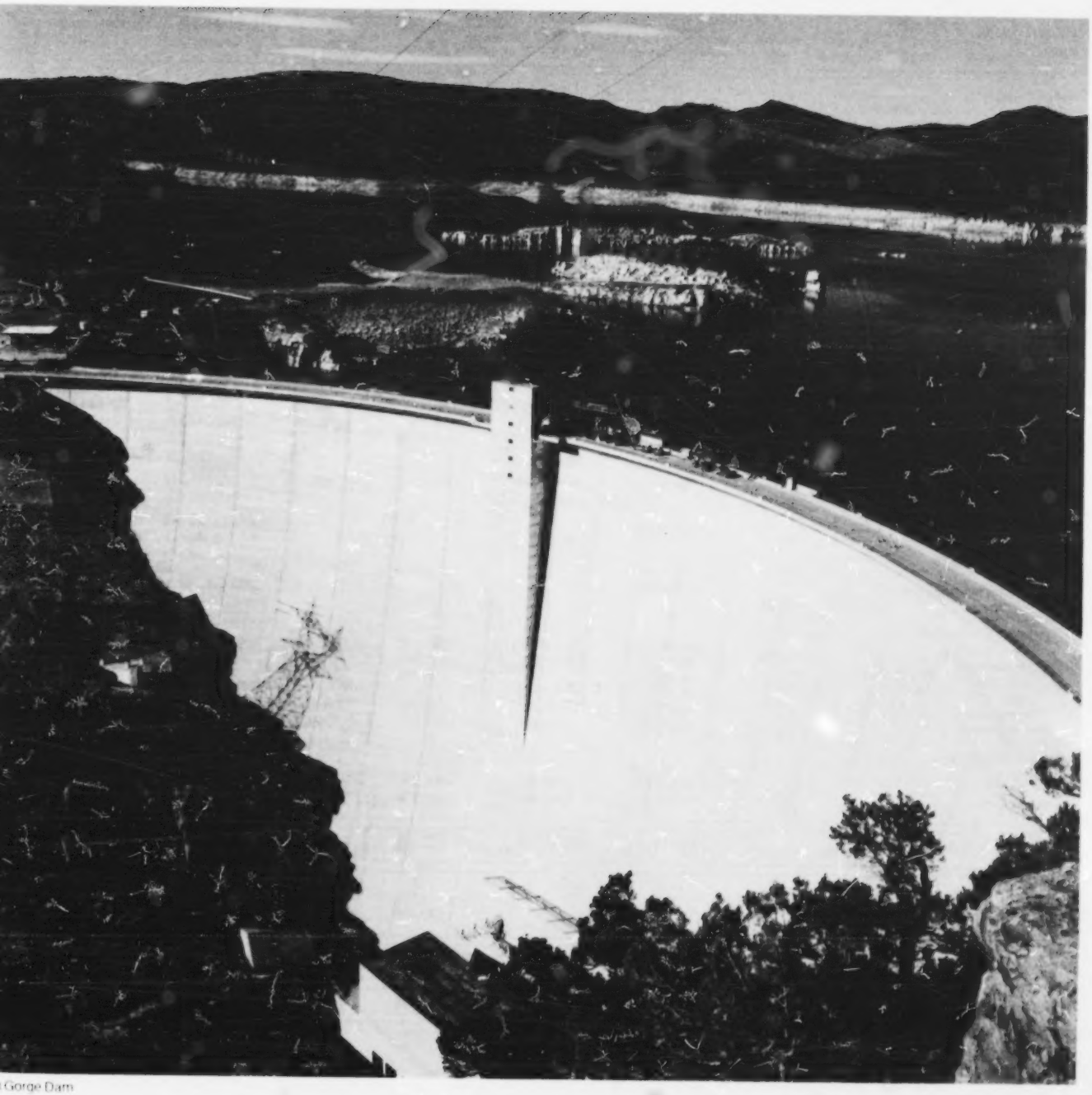
Allocation of Federal Investment

A preliminary allocation of total estimated costs of all authorized projects is summarized in this table.

Allocations to the various purposes authorized under Reclamation law are required by Sec. 6 of Public Law 84-485, the Colorado River Storage Project Act, excluding specific fish and wildlife and recreation expenditures authorized by Sec. 8 of this act. Final allocation reports have been prepared on the Colorado River Storage Project, and on Emery County, Florida, Paonia, Seedskadee, Silt, and Smith Fork Participating Projects, and the Vernal Unit of the Central Utah Project.

Project Costs Allocated (Excludes Section 8 Costs)	(Thousands of Dollars)
Reimbursable Allocations:	
Irrigation	$1,887,721
Power	1,193,322
Municipal and Industrial Water	834,914
Other	3,582
Total	$3,919,539
Nonreimbursable Allocations:	
Flood Control	$ 49,224
Fish and Wildlife	312,096
Recreation	7,198
Road Relocation Costs	25,247
Cultural Resources Activities	26,165
Safety of Dams	11,428
Total	$ 431,358
Other:	
Navajo Indian Irrigation Project[1]	$ 611,942
Total Costs Allocated	$4,962,839
Section 8 Costs:	
Fish and Wildlife	$ 134,717
Recreation	150,303
Total Costs Now Allocated	$ 285,020
Total	$5,247,859

[1]Repayment of construction costs is subject to the act of July 1, 1932 (47 Stat. 564).



Gorge Dam

Estimated Project Costs

Project	Costs through September 30, 1981					
	Project Costs	Interest During Construction	Section 8		Estimated Balance to Complete	Total Estimated Cost
			Fish & W.L.	Recreation		
Storage Project						
Wayne N. Aspinall Unit, Colorado	$ 138,050,767	$13,756,789	$ 3,192,506	$11,346,657	$ 10,187,023	$ 176,533,742
Flaming Gorge Unit, Utah	68,150,929	3,458,319	8,756,614	4,557,361	6,873,025	91,805,248
Glen Canyon Unit, Arizona	252,594,456	22,106,537	497,932	9,466,845	1,718,225	286,383,995
Navajo Unit, New Mexico	39,408,760	262,810	665,200	3,018,006	10,602,838	53,957,614
Transmission Division	201,420,448	10,400,699			96,134,346	307,955,493
Subtotal Storage Project	$ 699,625,360	$49,985,154	$13,121,252	$28,388,869	$ 125,515,457	$ 916,636,092
Participating Projects:						
State of Colorado						
Bostwick Park	9,119,857			973,763	125,246	10,218,866
Dallas Creek	32,762,273	2,200,762	1,688,599	2,353,552	52,734,814	91,740,000
Dolores	63,276,513	383,752	1,474,955	169,252	272,838,528	338,143,000
Florida	11,326,194			103,032		11,429,226
Fruitland Mesa	3,313,598				132,474,402	135,788,000
Paonia	8,173,927		10,000	94,707		8,278,634
San Miguel	3,805,648				109,705,352	113,511,000
Silt	7,450,244			60,027		7,510,271
Smith Fork	4,585,408			104,207		4,689,615
West Divide	2,919,677				242,042,323	244,962,000
States of Colorado — New Mexico						
Animas — LaPlata	4,928,099				509,505,901	514,434,000
San Juan — Chama	74,639,012	4,363,462	1,580,911	893,601	32,393,014	113,870,000
States of Colorado — Wyoming						
Savery — Pot Hook	2,429,756				118,742,244	121,172,000
State of New Mexico						
Hammond	7,417,959		5,800			7,423,759
Navajo Indian Irrigation	220,865,258				391,076,742	611,942,000
State of Utah						
Central Utah Project						
Bonneville Unit	275,885,315	30,146,259	7,081,176	12,457,125	1,253,021,125	1,578,591,000
Jensen Unit	40,720,211	3,735,926	42,503	1,107,743	19,442,617	65,049,000
Uintah Unit	5,462,619		193,000	3,149,000	147,029,381	155,834,000
Upalco Unit	5,207,179	3,948			73,928,873	79,140,000
Vernal Unit	10,270,246	43,615	16,198	110,495	145,205	10,585,759
Emery County	15,276,901	143,425	1,027,878	74,933	1,270,815	17,793,952
State of Wyoming						
LaBarge	222,108				4,711,892	4,934,000
Lyman	32,352,671	118,877	908,861	1,205,748	1,148,262	35,734,419
Seedskadee	24,217,401	1,492,954	2,887,208	636,989	7,885,803	37,120,355
Subtotal Participating Projects	$ 866,628,074	$42,632,980	$16,917,089	$23,494,174	$3,370,222,539	$4,319,894,856
Other Facilities						
Jones Hole Nat'l. Fish Hatchery, Utah			4,916,601		1,124,299	6,040,090
Hotchkiss Nat'l. Fish Hatchery, Colorado			1,540,316		3,745,784	5,286,100
Subtotal Other Facilities			6,456,917		4,870,083	11,327,000
Grand Total	$1,566,253,434	$92,618,134	$36,495,258	$51,883,043	$3,500,608,079	$5,247,857,948

stimated Project Costs by Purpose

September 30, 1981 (Amounts in Thousands of Dollars)

oject	Estimated Total Project Costs	Irrigation	Power	Municipal and Industrial Water	Flood Control	Fish and Wildlife	Highway Improvements	Recreation	Cultural Resources	Safety of Dams	Other[b]
rage Project:											
Wayne N. Aspinall Unit, Colorado	$ 176,534	$ 3,022	$148,364		$ 1,767	$ 4,599	$ 184	$18,598			
Flaming Gorge Unit, Utah	91,805	17,499	46,012			23,511		4,558			$ 255
Glen Canyon Unit, Arizona	286,384	54,018	209,904	$ 3,095		7,434		9,467			2,466
Navajo Unit, New Mexico	53,958	30,311		3,635	2,183	11,646		6,139			44
Transmission Division	307,955		307,240								715
Subtotal Storage Project	$ 916,636	$ 104,850	$711,520	$ 6,730	$ 3,950	$ 47,190	$ 184	$38,762			$3,450
ticipating Projects:											
State of Colorado											
Bostwick Park	10,219	6,433				915		2,871			
Dallas Creek	91,740	23,574		44,078	1,863	3,187	1,990	16,538	520		
Dolores	338,143	260,908		27,725	1,629	27,271	1,650	9,860	9,100		
Florida	11,429	9,720			120	1,486		103			
Fruitland Mesa	135,788	129,236				1,432		5,120			
Paonia	8,279	7,626			174	285		95			99
San Miguel	113,511	83,384		28,430		1,237		460			
Silt	7,510	6,735				565	150	60			
Smith Fork	4,690	4,300				286		104			
West Divide	244,962	174,509		63,636		6,217		600			
States of Colorado — New Mexico											
Animas — La Plata	514,434	333,557		138,367		17,200		8,800	16,510		
San Juan — Chama	113,870	61,920		41,119		8,589	1,346	896			
States of Colorado — Wyoming											
Savery — Pot Hook	121,172	117,514			1,365	857		1,436			
State of New Mexico											
Hammond	7,424	7,218				206					
Navajo Indian Irrigation	611,942	611,942[a]									
State of Utah											
Central Utah Project											
Bonneville Unit	1,578,591	378,867	478,213	417,578	37,353	187,688	18,193	60,699			
Jensen Unit	65,049	6,555		43,360	597	1,506	454	1,104	45	11,428	
Uintah Unit	155,834	82,235		3,700	1,802	64,948		3,149			
Upalco Unit	79,140	36,268		5,950	371	32,989	642	2,920			
Vernal Unit	10,586	9,615		613		246		111			1
Emery County	17,794	10,038		2,419		3,525	437	1,344			31
State of Wyoming											
LaBarge	4,934	4,752				182					
Lyman	35,734	26,268		1,169		7,077		1,220			
Seedskadee	37,120	1,638	3,589	10,040		20,401	201	1,250			1
Subtotal Participating Projects	$4,319,895	$2,394,812	$481,802	$828,184	$45,274	$388,295	$25,063	$118,740	$26,165	$11,428	$ 132
er Facilities											
ones Hole Nat'l. Fish Hatchery, Utah	6,041					6,041					
otchkiss Nat'l. Fish Hatchery, Colo.	5,286					5,286					
Subtotal Other Facilities	11,327					11,327					
nd Total	$5,247,858	$2,499,662	$1,193,322	$834,914	$49,224	$446,812	$25,247	$157,502	$26,165	$11,428	$3,582

nanced with Bureau of Indian Affairs appropriations.
oject costs financed by contributions.

Estimated Repayment of Federal Investment

Fontenelle Dam and Reservoir.

Lining the Coury Lateral, NIIP.

Reimbursable Investment	September 30, 1981	(In Thousands)
Colorado River Storage Project and Participating Projects		$3.919.540
Eden Project (Irrigation portion to be paid from CRSP Revenue)		9.685
Salinity Control Projects (Portion to be paid from CRSP Revenues)		14.454
Total reimbursable from CRSP Revenue		$3.943.679

Allocation and Repayment	Estimated Repayment	Tentative Allocation
Irrigation		$1.911.861
Water User Organizations	$ 160.402	
Power and M&I Water Revenue — Storage Units	104.438	
Apportioned Revenues — Participating Project Costs	1.622.987	
Miscellaneous Revenues and Contributed Funds	4.949	
Unpaid Balance	19.085[1]	
Power		1.193.322
Power Revenues	1.148.922	
Miscellaneous Revenues and Contributed Funds	44.400	
Municipal and Industrial Water		834.914
M&I Water Revenues	833.526	
Miscellaneous Revenues and Contributed Funds	1.388	
Other		3.582
Miscellaneous Revenues and Contributed Funds	3.582	
Total	$3.943.679	$3.943.679

[1]Represents deferred payments on Indian lands of the Animas-LaPlata, Dolores, Florida, and Central Utah Projects.

Progress of Repayment

Currant Creek Dam, right center

Looking south at Ridgway Damsite

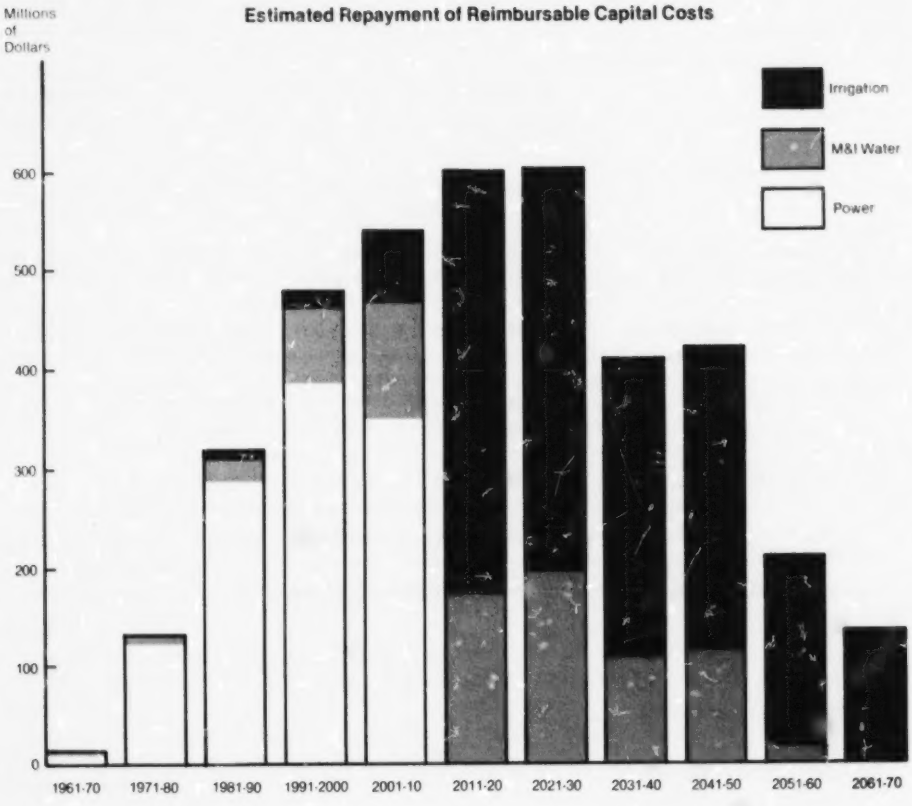
Principal payout and interest payments on the inservice reimbursable Federal investment are summarized in this table.

	Inservice Investment	Revenues Applied to Payout of Investment	Unpaid Balance	Interest Payments
Power				
Storage project and power portion of participating projects	$554,435,561	$132,042,236	$422,393,235	$184,466,722
M&I Water				
Storage project	$ 6,697,644	$ 5,626,593	$ 1,069,051	$ 936,681
Participating projects	62,537,554	3,657,011	61,150,289[1]	4,769,304
Subtotal M&I Water	$ 69,235,198	$ 9,285,604	$ 62,219,340	$ 5,705,985
Irrigation				
Storage Project	$ 99,592,387	—	$ 99,592,387	—
Participating projects and Eden	136,475,966	$ 2,710,590	133,765,376	—
Subtotal Irrigation	$236,068,353	$ 2,710,590	$233,357,763	—
Total	$859,739,112	$144,038,520	$717,970,338	$190,172,707

[1]Increased by $2,269,746 capitalized interest 1969-1977 — Seedskadee Project.

Rate of Repayment

Emery County farmer checking irrigation



During fiscal year 1981, more than $11 million was applied toward repayment of the Federal investment in the Colorado River Storage Project and participating projects. Total repayment received to date amounts to more than $149 million, which is about 17 percent of the $860 million completed plant-in-service and nearly 4 percent of the $3.9 billion projected total reimbursable Federal investment in the authorized storage units and participating projects. In addition to the amount applied to repayment of the reimbursable investment, the Project earned revenues sufficient to pay all operating costs, current reimbursable interest and replacement costs. Operating costs of participating projects which have been turned over to the water conservancy districts for operation were paid by the respective Conservancy Districts. More than 22 percent of the projected reimbursable Federal investment was in service as of the end of the fiscal year.

Power sales produced 85 percent of the net revenues during fiscal year 1981. All of these power revenues were applied toward the power investment in the storage units and participating projects. Nearly 12 percent of the estimated power investment has now been repaid. The more than $9.5 million repaid by power revenues in fiscal year 1981 is less than the $35.5 million repaid in fiscal year 1980, but is much more than the $2.5 million deficit in fiscal year 1979.

During fiscal year 1981, more than a half-million dollars in repayment revenue came from municipal and industrial water sales from Glen Canyon and Navajo Units. All of this revenue was applied toward repayment of the municipal and industrial water investment in the storage units. Through fiscal year 1981, municipal and industrial water revenues have repaid more than 80 percent of the municipal and industrial water investment in the storage units. An additional three-fourths

Lining canal on Grand Valley, Stage One.

Long shadows on Lake Powell

of a million dollars in repayment revenues came from municipal and industrial water sales from six participating projects. This amount was applied to repayment of municipal and industrial water investments in the participating projects. During the year, irrigators paid more than a quarter of a million dollars toward repayment of the irrigation allocation in the participating projects.

Through fiscal year 1981, power revenues have paid $137 million, municipal and industrial water revenues have paid more than $9 million, and irrigators have paid nearly $3 million. All of this repayment is in addition to operating costs and more than $190 million in reimbursable interest. To date, Colorado River Storage Project revenues have been more than two-thirds of a billion dollars; half of which has been returned to the Federal treasury as repayment and interest on the investment.

Repayment contracts hae been executed for 17 of the 24 participating projects, 15 of which are constructed or under construction. The Navajo Indian Irrigation Project is also under construction, but a repayment contract is not required for this non-reimbursable Indian project. Of the eight projects on which construction has not yet started, a contract has been executed on two of them, one is nearing contract execution, four are in the advance planning stage and one has been postponed indefinitely.

It is necessary to increase the CRSP power selling rate in order to provide revenues sufficient to pay annual operating costs of the storage units, provide for replacements, pay interest charges, repay costs of storage units and participating projects allocated to power, assist in repayment of storage unit costs allocated to irrigation, pay specified salinity costs, and provide assistance in repaying the irrigation allocation of authorized participating projects within the time limits prescribed by law.

The present rate was placed in effect in January 1981 and the Power Repayment Study, which was made for this report, assumes a 31 percent increase beginning with fiscal year 1983. The present rate is about 32 percent above the original CRSP power rate which was in effect prior to April 1974. The assumed 1983 rate is about 73 percent above the original rate. These increases are reflected in the exhibit in the envelope on the inside back cover.

The principal reasons for the increases and projected increases over the original CRSP rate include the inflationary rise in present and projected power system operating costs, estimated higher costs to complete construction of the authorized storage units and participating projects, including mitigation and environmental protection costs, the increased cost of purchased energy required to fulfill contract commitments, and the increase in the construction and operating costs of four specific authorized Colorado River Salinity Control Projects (Public Law 93-320, 88 Stat. 266).

Projections using current estimates of CRSP costs, construction schedules, and revenues from power sales (including the proposed rate increase), municipal and industrial water sales, payments by irrigators, ad valorem taxes, and miscellaneous revenues show that payment of the reimbursable costs of the authorized Colorado River Storage Project and participating projects can be accomplished within the repayment periods.

Power Repayment Study

Substation on Navajo Indian Irrigation Project

Blue Mesa Dam of the Aspinall Unit

Results of the power repayment study for fiscal year 1981 are depicted in the graph on page 35. Estimated annual power revenues are shown together with their application. Total revenues for the period shown exceed $7.3 billion. After repayment of about $1.6 billion for the power investment and replacements and $495 million for interest, power revenues should be sufficient to repay about $86 million in irrigation costs and provide around $2.3 billion for assistance in repayment of participating projects.

Following are explanatory notes on the terms used on the graph. Copies of the power repayment study in a highly detailed form can be obtained upon request.

Annual Operating Expenses

Annual costs of power O&M, salinity control, wheeling and other costs.

Energy Purchases

Annual costs of purchases for firming energy for fuel conservation and for energy to replace the deficiency in Hoover Dam Powerplant generation caused by storage project operations. In past years, energy purchases for fuel conservation are shown as energy purchase expenses and the revenues from energy sales for fuel conservation are included in the gross revenues. In future years only the net revenue from energy purchases for fuel conservation was projected.

Replacements

Payments made on power replacements with the highest interest-bearing component (whether replacements or other power investments) being paid first.

Power Interest Payments

Annual interest on the unpaid power investment.

Power Principal Payments

Payments made on the power investment with the highest interest-bearing component (whether power investment or replacement) being paid first.

Storage Unit Irrigation Principal Payments

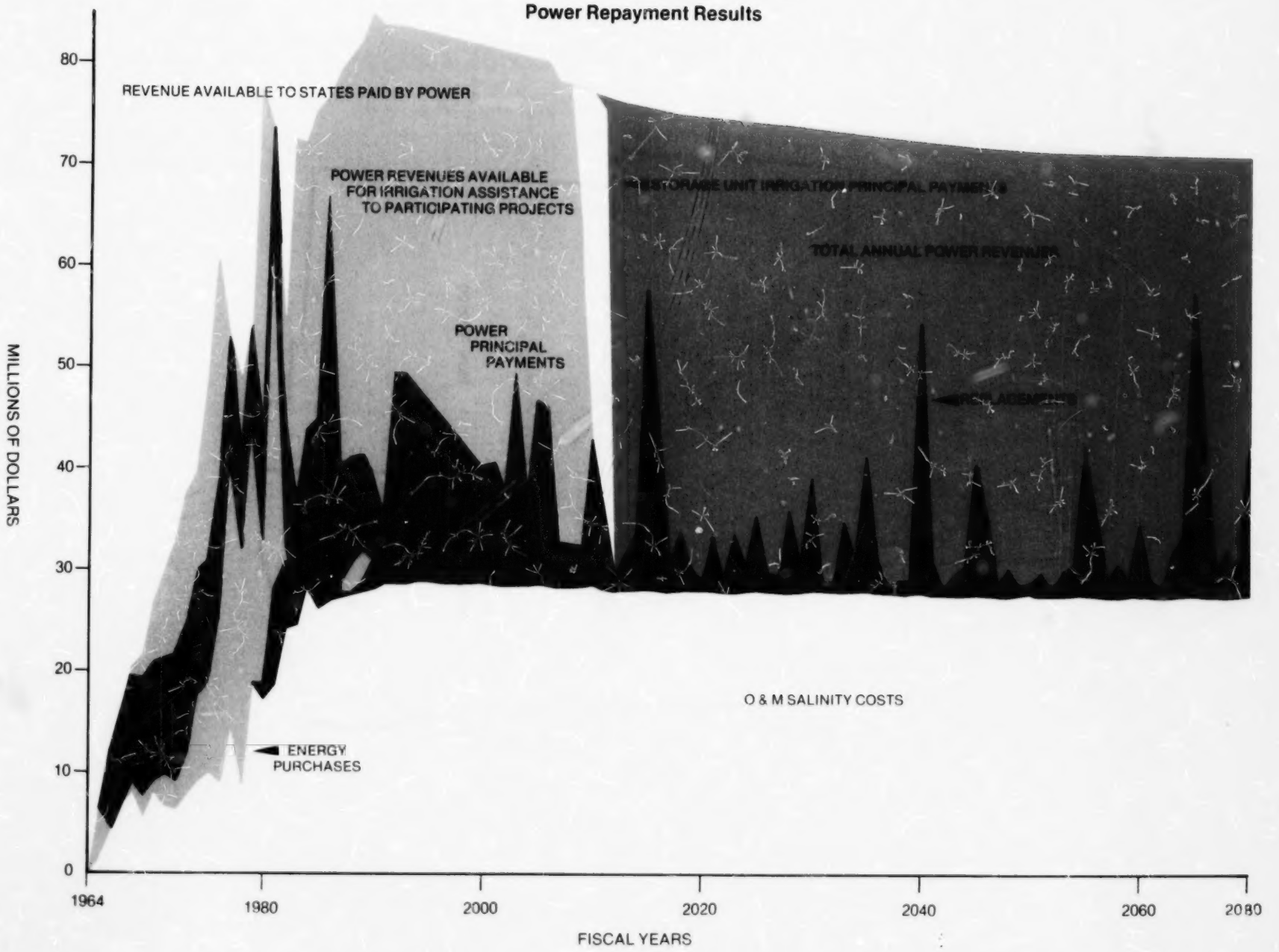
Power revenues which are applied toward payment of the irrigation allocation of the storage units. Their revenues repay the major portion (about $86 million or 82 percent) of each cost with the remainder (about $18 million, or 18 percent) being repaid from M&I water revenues.

Power Revenues Available for Irrigation Assistance to Participating Projects

Power revenues available after the above costs have been paid, the amount of which will be about $2,312 million through year 2070. A lesser amount (about $18 million or 1 percent of the total available) will also be available from M&I water revenues.

Total Annual Power Revenues

Annual revenues obtained from energy and capacity sales, wheeling for others, rental of substation facilities to others, reimbursement by the Lower Basin for energy purchased by the CRSP to replace the deficiency in Hoover Dam Powerplant generation, and miscellaneous revenues. In the study, the firm power rate of $1.65 per kilowatt-month and 4.0 mills per kilowatt-hour was assumed to increase to $2.19 per kilowatt-month and 5.2 mills per kilowatt-hour beginning with fiscal year 1982, in order to meet repayment requirements.


Power Repayment Results
REVENUE AVAILABLE TO STATES PAID BY POWER
POWER REVENUES AVAILABLE FOR IRRIGATION ASSISTANCE TO PARTICIPATING PROJECTS
POWER PRINCIPAL PAYMENTS
TOTAL ANNUAL POWER REVENUES
O & M SALINITY COSTS
ENERGY PURCHASES
MILLIONS OF DOLLARS
80
70
60
50
40
30
20
10
0
1964
1980
2000
2020
2040
2060
2080
FISCAL YEARS

Wyoming
Fontenelle Reservoir
Kemmerer
Flaming Gorge Reservoir
Flaming Gorge Dam
Yampa River
Duchesne River
Price River
White River
Utah
Green River
Grand Junction
San Rafael River
Colorado
Morrow Point Dam
Blue Mesa Dam
Crystal Reservoir
Lake Powell
Dolores River
Durango
Glen Canyon Dam
Navajo Reservoir
Navajo Dam
Upper Basin Boundary
Arizona
New Mexico

HISTORICAL AND PROJECTED REPAYMENT OF AUTHORIZED REIMBURSABLE INVESTMENT (UNITS — $1,000)

YEAR OF STUDY 1	FISCAL YEAR 2	POWER INVESTMENT STORAGE AND PARTICIPATING PROJECTS: POWER REVENUES APPLIED 3	ELECTRIC PLANT: IN SERVICE AT END OF YEAR 4	ELECTRIC PLANT: UNPAID BALANCE 5	ELECTRIC PLANT: ALLOWABLE UNPAID BALANCE 6	M & I WATER INVESTMENTS STORAGE PROJECTS: M & I REVENUES APPLIED 7	M & I PLANT: IN SERVICE AT END OF YEAR 8	M & I PLANT: UNPAID BALANCE 9	M & I PLANT: ALLOWABLE UNPAID BALANCE 10	IRRIGATION INVESTMENT STORAGE PROJECTS: POWER AND M & I REVENUES APPLIED 11	IRRIGATION: IN SERVICE AT END OF YEAR 12	IRRIGATION: UNPAID BALANCE 13	IRRIGATION: ALLOWABLE UNPAID BALANCE 14	IRRIGATION INVESTMENT PARTICIPATING PROJECTS: IRRIGATION AND APPORTIONED REVENUES APPLIED 15	IRRIGATION: IN SERVICE AT END OF YEAR 16	IRRIGATION: UNPAID BALANCE 17	IRRIGATION: ALLOWABLE UNPAID BALANCE 18	M & I INVESTMENT PARTICIPATING PROJECTS: M & I REVENUES APPLIED 19	M & I PLANT: IN SERVICE AT END OF YEAR 20	M & I PLANT: UNPAID BALANCE 21	M & I PLANT: ALLOWABLE UNPAID BALANCE 22	REPAYMENT SUMMARY: TOTAL REVENUES APPLIED 23	TOTAL PLANT: IN SERVICE AT END OF YEAR 24	TOTAL PLANT: UNPAID BALANCE 25	TOTAL PLANT: ALLOWABLE UNPAID BALANCE 26	CUMULATIVE APPORTIONED REVENUES AVAILABLE FOR FUTURE PARTICIPATING PROJECTS: TOTAL 27	COLORADO 28	NEW MEXICO 29	UTAH 30	WYOMING 31	FISCAL YEAR 32	YEAR OF STUDY 33
0	1961													24	7,307	7,283	7,307														1961	0
1	1962										30,790	30,790	30,790		11,090	11,066	11,090	24	547	523	547	24	2,307	7,283	7,307						1962	1
2	1963										40,108	40,108	40,108		15,373	15,348	15,373	−4	556	536	556	20	42,427	42,379	42,427						1963	2
3	1964	174	56,915	56,742	56,915						72,388	72,388	72,388		18,082	18,057	18,082	5	577	552	577	170	112,952	112,734	112,952						1964	3
4	1965	−2,630	246,164	248,620	246,164						87,823	87,823	87,823		27,411	27,387	27,411	8	593	560	593	−2,625	337,211	339,617	337,211						1965	4
5	1966	−498	346,175	349,130	346,175		11,867	11,867	11,867		89,055	89,055	89,055		37,817	37,762	37,817	−9	669	645	669	−490	473,869	476,767	473,869						1966	5
6	1967	−1,243	358,646	362,844	358,646	−737	11,819	12,557	11,819		93,063	93,063	93,063	31	44,634	44,528	44,634	−9	669	641	669	−1,958	498,006	502,863	498,006						1967	6
7	1968	833	402,241	405,605	402,241	780	13,087	13,044	13,087		94,145	94,145	94,145	51	45,086	44,929	45,086	−9	1,570	1,551	1,570	1,668	553,694	556,881	553,694						1968	7
8	1969	2,338	410,794	411,820	410,794	5	13,600	13,552	13,600		94,015	94,015	94,015	50	49,360	49,143	49,360	9	2,684	2,656	2,684	2,384	565,195	565,997	565,195						1969	8
9	1970	5,857	411,937	407,106	411,937	16	15,510	15,446	15,510		104,240	104,240	104,240	61	49,360	49,143	49,360	9	5,943	5,906	5,943	5,943	573,506	568,366	573,506						1970	9
10	1971	8,425	461,517	448,224	461,517	8	100	27	100		101,227	101,227	101,227	121	60,395	60,057	60,395		7,304	7,276	7,304	8,554	633,556	619,824	633,556						1971	10
11	1972	10,974	464,416	440,186	464,416	337	3,148	2,739	3,148		100,470	100,470	100,470	185	81,010	80,487	81,010	5	10,725	10,692	10,725	11,501	660,526	635,331	660,526						1972	11
12	1973	13,306	465,544	428,008	465,544	290	4,048	3,349	4,048		99,636	99,636	99,636	234	104,575	103,818	104,575	8	44,868	44,827	44,868	13,838	719,505	680,472	719,505						1973	12
13	1974	9,862	467,498	420,100	467,498	291	4,897	3,907	4,897		98,116	98,116	98,116	245	116,710	115,708	116,710	−18	44,831	44,808	44,831	10,380	733,572	684,159	733,572						1974	13
14	1975	17,397	465,527	400,732	465,527	493	5,858	4,375	5,858		98,650	98,650	98,650	267	127,313	126,044	127,313	80	53,777	53,674	53,777	18,237	750,591	682,941	750,591						1975	14
15	1976	22,584	465,069	377,690	465,069	560	7,065	5,022	7,065		98,822	98,822	98,822	221	122,353	120,863	122,352	102	53,777	53,572	53,777	23,467	746,914	655,797	746,913						1976	15
16	1977	181	478,887	391,327	478,887	653	7,295	4,599	7,295		98,653	98,653	98,653	244	124,661	122,927	124,661	656	61,147	62,886	63,747	1,734	770,812	680,561	773,412						1977	16
17	1978	7,046	541,015	446,409	541,015	839	7,615	4,919	7,615		99,544	99,544	99,544	193	133,179	131,252	133,179	562	61,486	62,330	63,753	8,640	841,948	743,563	844,215						1978	17
18	1979	−2,540	555,628	463,562	555,628	733	6,698	2,430	6,698		99,505	99,505	99,505	232	125,364	123,205	125,364	713	61,498	61,625	63,761	−862	848,732	750,366	850,995						1979	18
19	1980	35,561	553,280	425,653	553,280	652	6,698	1,778	6,698		99,505	99,505	99,505	287	124,932	122,486	124,932	726	62,525	61,933	64,795	37,226	846,940	711,355	849,210						1980	19
20	1981	9,675	554,435	417,133	554,435	588	6,698	1,190	6,698		99,592	99,592	99,592	265	136,476	133,765	136,476	796	62,537	61,149	64,807	11,324	859,738	712,829	862,008						1981	20
SUBTOTAL		137,302	554,435			5,508	6,698				99,592			2,711	136,476			3,658	62,537			149,179	859,738								SUBTOTAL	
21	1982	12,498	566,659	416,859	566,659	726	6,698	464	6,698		104,437	104,437	104,437	265	172,631	169,654	172,631	736	65,395	63,271	67,665	14,225	915,820	754,685	918,090						1982	21
22	1983	35,411	641,137	455,925	641,137	464	6,698		6,698	283	104,437	104,154	104,437	320	172,631	169,335	172,631	428	83,674	81,122	85,944	36,906	1,006,577	810,536	1,010,847						1983	22
23	1984	28,260	668,944	455,473	668,944		6,698		6,698	760	104,437	103,394	104,437	345	277,548	273,907	277,548	499	198,961	195,910	201,231	29,964	1,256,588	1,028,684	1,258,858						1984	23
24	1985	30,304	669,784	426,009	669,784		6,698		6,698	760	104,437	102,634	104,437	419	353,239	349,179	353,239	1,256	240,890	236,583	243,160	32,739	1,375,048	1,114,405	1,377,318						1985	24
25	1986	9,089	671,055	418,191	671,055		6,698		6,698	760	104,437	101,874	104,437	515	420,110	415,535	420,110	1,752	272,425	266,366	274,695	12,116	1,474,725	1,201,966	1,476,995						1986	25
26	1987	38,540	671,055	379,651	671,055		6,698		6,698	760	104,437	101,114	104,437	517	502,108	497,106	502,108	2,235	318,164	309,870	320,434	42,052	1,660,462	1,287,651	1,664,732						1987	26
27	1988	39,292	671,055	340,359	671,055		6,698		6,698	760	104,437	100,354	104,437	623	558,727	553,012	558,727	2,883	354,608	343,431	356,878	43,558	1,695,525	1,337,156	1,697,795						1988	27
28	1989	40,382	671,055	299,977	671,055		6,698		6,698	760	104,437	99,594	104,437	623	663,423	657,085	663,423	3,418	401,308	386,713	403,578	45,183	1,848,921	1,443,369	1,849,191						1989	28
29	1990	45,445	671,055	254,532	671,055		6,698		6,698	760	104,437	98,834	104,437	689	663,423	656,396	663,423	4,153	443,356	424,606	445,626	51,047	1,868,969	1,434,370	1,891,239						1990	29
30	1991	47,934	1,148,857	684,400	1,148,857		6,698		6,698	760	104,437	98,074	104,437	731	701,444	693,686	701,444	4,856	506,428	482,824	508,698	54,281	2,467,864	1,958,984	2,470,134						1991	30
31	1992	34,035	1,148,857	650,365	1,148,857		6,698		6,698	760	104,437	97,314	104,437	792	989,108	980,558	989,108	5,845	686,069	656,620	688,839	41,432	2,935,169	2,384,857	2,937,939						1992	31
32	1993	33,950	1,148,857	616,415	1,148,857		6,698		6,698	760	104,437	96,554	104,437	810	1,210,854	1,201,494	1,210,854	6,648	734,924	696,827	737,194	42,168	3,203,779	2,613,290	3,206,040						1993	32
33	1994	35,162	1,148,857	581,253	1,148,857		6,698		6,698	760	104,437	95,794	104,437	873	1,251,282	1,241,049	1,251,282	7,519	734,924	691,308	737,194	44,314	3,246,198	2,609,404	3,246,466						1994	33
34	1995	36,352	1,148,857	544,901	1,148,857		6,698		6,698	760	104,437	95,034	104,437	1,028	1,280,266	1,269,005	1,280,266	7,935	734,924	683,373	737,194	46,075	3,275,182	2,592,313	3,277,452						1995	34
35	1996	37,424	1,148,857	507,477	1,148,857		6,698		6,698	760	104,437	94,274	104,437	1,166	1,280,266	1,267,839	1,280,266	8,244	734,924	675,129	737,194	47,594	3,275,182	2,544,719	3,277,452						1996	35
36	1997	38,342	1,148,857	469,135	1,148,857		6,698		6,698	760	104,437	93,514	104,437	1,283	1,280,266	1,266,556	1,280,266	8,551	734,924	666,578	737,194	48,936	3,275,182	2,495,783	3,277,452						1997	36
37	1998	39,106	1,148,857	430,029	1,148,857		6,698		6,698	760	104,437	92,754	104,437	1,463	1,280,266	1,265,093	1,280,266	8,878	734,924	657,700	737,194	50,207	3,275,182	2,445,576	3,277,452						1998	37
38	1999	40,246	1,148,857	389,783	1,148,857		6,698		6,698	760	104,437	91,994	104,437	1,498	1,280,266	1,263,595	1,280,266	9,211	734,924	648,507	737,194	51,715	3,275,182	2,393,879	3,277,452						1999	38
39	2000	41,327	1,148,857	348,456	1,148,857		6,698		6,698	760	104,437	91,234	104,437	1,499	1,280,266	1,262,096	1,280,266	9,557	734,924	638,986	737,194	53,143	3,275,182	2,340,772	3,277,452						2000	39
40	2001	40,757	1,148,857	307,699	1,148,857		6,698		6,698	760	104,437	90,474	104,437	1,566	1,280,266	1,260,530	1,280,266	9,910	734,924	629,111	737,194	52,993	3,275,182	2,287,814	3,277,452						2001	40
41	2002	43,598	1,148,857	264,101	1,148,857		6,698		6,698	760	104,437	89,714	104,437	1,721	1,280,266	1,258,809	1,280,266	10,276	734,924	618,871	736,588	56,355	3,275,182	2,231,495	3,276,846						2002	41
42	2003	31,775	1,148,857	232,326	1,148,857		6,698		6,698	760	104,437	88,954	104,437	1,723	1,280,266	1,257,086	1,280,266	10,759	734,924	608,112	736,588	45,017	3,275,182	2,186,478	3,276,846						2003	42
43	2004	42,395	1,148,857	189,931	1,148,857		6,698		6,698	760	104,437	88,194	104,437	1,726	1,280,266	1,255,360	1,280,266	11,139	734,924	596,973	736,588	56,020	3,275,182	2,130,458	3,276,846						2004	43
44	2005	33,350	1,148,857	156,581	1,148,857		6,698		6,698	760	104,437	87,434	104,437	2,085	1,280,266	1,253,275	1,280,266	11,537	734,924	585,436	736,588	47,732	3,275,182	2,082,726	3,276,846						2005	44
45	2006	33,826	1,148,857	122,755	1,148,857		6,698		6,698	295	104,437	87,139	104,437	2,153	1,280,266	1,251,122	1,280,266	11,953	734,924	573,483	736,588	46,227	3,275,182	2,034,499	3,276,846						2006	45
46	2007	45,423	1,148,857	77,332	1,148,857		6,698		6,698	295	104,437	86,844	104,437	2,256	1,280,266	1,248,866	1,280,266	12,384	734,924	561,099	736,588	60,358	3,275,182	1,974,141	3,276,846						2007	46
47	2008	45,350	1,148,857	31,982	1,148,857		6,698		6,698	295	104,437	86,549	104,437	2,390	1,280,266	1,246,476	1,280,266	12,832	734,924	548,267	736,586	60,867	3,275,182	1,913,274	3,276,846						2008	47
48	2009	31,982	1,148,857		1,148,857		6,698		6,698	13,399	104,437	73,150	104,437	2,392	1,332,491	1,296,309	1,332,491	13,298	828,492	626,873	828,492	61,071	3,410,311	1,996,332	3,420,975						2009	48
49	2010		1,148,857		1,148,857		6,698		6,698	34,401	104,437	38,749	104,437	2,392	1,788,185	1,749,611	1,788,185	14,085	826,828	612,788	828,492	50,878	3,875,005	2,401,148	3,876,669						2010	49
50	2011		1,148,857		1,148,857		6,698		6,698	38,749	104,437		104,437	3,675	1,788,185	1,745,936	1,788,185	14,616	826,828	598,215	828,492	57,040	3,875,005	2,344,151	3,876,669						2011	50
51	2012		1,148,857		1,148,857		6,698		6,698	3,074	104,437		74,180	49,799	1,788,185	1,696,137	1,788,185	15,169	826,828	583,166	828,492	64,968	3,875,005	2,279,303	3,842,788						2012	51
52	2013		1,148,857		1,148,857	3,074	6,698		6,698		104,437		56,845	47,191	1,788,185	1,648,946	1,788,184	15,652	826,828	567,544	828,492	62,843	3,875,005	2,216,490	3,825,452						2013	52
53	2014		1,148,857		1,091,942		6,698		6,698		104,437		3,017	44,890	1,788,185	1,604,056	1,788,184	16,224	826,828	551,320	826,073	61,114	3,875,005	2,155,376	3,709,216						2014	53
54	2015		1,148,857		902,693		6,698		6,698		104,437		3,017	21,384	1,788,185	1,582,672	1,788,185	16,853	826,828	534,467	825,818	38,237	3,875,005	2,117,139	3,519,713						2015	54
55	2016		1,148,857		802,682		6,698		6,698		104,437		3,017	33,571	1,788,185	1,549,161	1,778,651	17,491	826,828	516,976	825,818	51,062	3,875,005	2,066,077	3,410,168						2016	55
56	2017		1,148,857		790,211		6,698		6,698		104,437			47,625	1,788,185	1,501,476	1,773,195	18,159	826,828	498,817	814,408	65,784	3,875,005	2,000,293	3,377,814						2017	56
57	2018		1,148,857		746,616		6,698		6,698		104,437			44,198	1,788,185	1,457,278	1,773,195	18,388	826,828	472,429	814,408	62,586	3,875,005	1,929,707	3,334,219						2018	57
58	2019		1,148,857		738,063		6,698		6,698		104,437			47,733	1,788,185	1,409,545	1,763,177	19,127	826,828	461,302	814,285	66,860	3,875,005	1,870,847	3,315,525						2019	58
59	2020		1,148,857		736,920		6,698		6,698		104,437			49,094	1,788,185	1,360,451	1,763,177	19,899	826,828	441,403	813,707	68,993	3,875,005	1,801,854	3,313,604						2020	59
60	2021		1,148,857		687,340		6,698		6,698		104,437			44,678	1,788,185	1,315,773	1,746,902	20,702	826,828	420,701	813,707	65,380	3,875,005	1,736,474	3,247,949						2021	60
61	2022		1,148,857		684,411		6,698		6,698		104,437			49,385	1,788,185	1,266,388	1,746,902	21,528	826,828	399,173	813,707	70,913	3,875,005	1,665,561	3,245,050						2022	61
62	2023		1,148,857		683,313		6,698		6,698		104,437			45,011	1,788,185	1,221,377	1,730,384	21,662	826,828	377,511	804,014	66,673	3,875,005	1,598,888	3,217,711						2023	62
63	2024		1,148,857		681,359		6,698		6,698		104,437			47,961	1,788,185	1,173,516	1,730,384	21,937	826,828	355,574	761,059	69,798	3,875,005	1,529,090	3,172,802						2024	63
64	2025		1,148,857		683,330		6,698		6,698		104,437			42,988	1,788,185	1,130,528	1,692,003	20,981	826,828	334,593	723,575	63,969	3,875,005	1,465,121	3,098,908						2025	64
65	2026		1,148,857		683,788		6,698		6,698		104,437			47,466	1,788,185	1,083,062	1,692,003	19,783	826,828	314,810	692,040	67,249	3,875,005	1,397,872	3,067,831						2026	65
66	2027		1,148,857		669,970		6,698		6,698		104,437			38,165	1,788,185	1,044,897	1,692,003	19,232	826,828	295,578	638,931	57,397	3,875,005	1,340,475	3,000,904	9,422		5,382		4,040	2027	66
67	2028		1,148,857		607,842		6,698		6,698		104,437			29,639	1,788,185	1,015,258	1,682,318	17,869	826,828	277,709	607,390	47,508	3,875,005	1,292,967	2,897,550	11,833		6,024		5,809	2028	67
68	2029		1,148,857		593,229		6,698		6,698		104,437			32,947	1,788,185	982,311	1,682,318	17,290	826,828	260,419	565,334	50,237	3,875,005	1,242,730	2,840,881	13,296		6,769		6,527	2029	68
69	2030		1,148,857		595,577		6,698		6,698		104,437			27,341	1,788,185	954,970	1,675,976	16,242	826,828	244,177	523,129	43,583	3,875,005	1,199,147	2,794,682	10,813		5,505		5,308	2030	69
70	2031		1,148,857		594,422		6,698		6,698		104,437			34,320	1,788,185	920,650	1,675,976	15,159	826,828	229,018	459,920	49,479	3,875,005	1,149,668	2,730,318	13,901		7,076		6,825	2031	70
71	2032		1,148,857		582,198		6,698		6,698		104,437			34,058	1,788,185	886,592	1,637,118	13,125	826,828	215,893	415,139	47,183	3,875,005	1,102,485	2,634,455	13,783		7,016		6,767	2032	71
72	2033		1,148,857		507,720		6,698		6,698		104,437			29,744	1,788,185	856,848	1,623,361	11,737	826,828	204,156	335,458	41,481	3,875,005	1,061,004	2,466,539	11,885		6,049		5,836	2033	72
73	2034		1,148,857		479,913		6,698		6,698		104,437			32,015	1,788,185	824,833	1,582,505	9,830	826,828	194,326	295,243	41,845	3,875,005	1,019,159	2,357,661	12,898		6,565		6,333	2034	73
74	2035		1,148,857		479,073		6,698		6,698		104,437			25,274	1,788,185	799,559	1,582,505	8,200	826,828	184,126	293,335	33,474	3,875,005	985,685	2,354,913	9,939		5,059		4,880	2035	74
75	2036		1,148,857		477,802		6,698		6,698		104,437			31,881	1,788,185	767,678	1,559,058	8,694	826,828	177,432	293,043	40,575	3,875,005	945,110	2,329,903	12,880		6,555		6,325	2036	75
76	2037		1,148,857		477,802		6,698		6,698		104,437			33,657	1,788,185	734,021	1,523,574	9,365	826,828	168,067	293,043	43,022	3,875,005	902,088	2,294,419	13,660		6,951		6,709	2037	76
77	2038		1,148,857		477,802		6,698		6,698		104,437			32,969	1,788,185	701,052	1,523,574	10,089	826,828	157,978	289,082	43,058	3,875,005	859,030	2,290,458	13,398		6,817		6,581	2038	77
78	2039		1,148,857		477,802		6,698		6,698		104,437			32,978	1,788,185	668,074	1,448,585	10,619	826,828	147,359	275,965	43,597	3,875,005	815,433	2,202,352	13,396		6,816		6,580	2039	78
79	2040		1,148,857				6,698		6,698		104,437			15,074	1,788,185	653,000	1,365,328	10,717	826,828	136,642	275,965	25,791	3,875,005	789,642	2,119,095	5,499		2,799		2,700	2040	79
80	2041		1,148,857				6,698		6,698		104,437			31,264	1,788,185	621,736	1,334,686	11,573	826,828	125,069	275,380	42,837	3,875,005	746,805	1,610,068	12,680		6,451		6,229	2041	80
81	2042		1,148,857				6,698		6,698		104,437			32,984	1,788,185	588,752	1,330,137	12,486	826,828	112,583	252,528	45,470	3,875,005	701,335	1,582,665	13,538		6,887		6,651	2042	81
82	2043		1,148,857				6,698		6,698		104,437			31,885	1,788,185	556,897	1,257,913	11,492	826,828	101,091	244,433	43,347	3,875,005	657,988	1,502,346	13,040		6,633		6,407	2043	82
83	2044		1,148,857				6,698		6,698		104,437			31,243	1,788,185	525,654	1,205,964	11,855	826,828	89,236	210,593	43,096	3,875,005	614,890	1,416,561	12,792		6,507		6,285	2044	83
84	2045		1,148,857				6,698		6,698		104,437			23,956	1,788,185	501,698	1,132,516	10,802	826,828	78,434	208,062	34,758	3,875,005	580,132	1,340,578	9,635		4,901		4,734	2045	84
85	2046		1,148,857				6,698		6,698		104,437			27,362	1,788,185	474,336	1,005,170	11,600	826,828	66,834	208,062	38,962	3,875,005	541,170	1,213,232	11,190		5,692		5,498	2046	85
86	2047		1,148,857				6,698		6,698		104,437			31,836	1,788,185	442,500	890,176	12,599	826,828	54,235	208,062	44,435	3,875,005	496,735	1,098,238	13,217		6,722		6,495	2047	86
87	2048		1,148,857				6,698		6,698		104,437			30,529	1,788,185	411,971	858,949	13,673	826,828	40,562	207,145	44,202	3,875,005	452,533	1,066,094	12,720		6,469		6,251	2048	87
88	2049		1,148,857				6,698		6,698		104,437			31,287	1,788,185	380,684	851,637	14,813	826,828	25,749	115,241	46,100	3,875,005	406,433	966,876	13,210		6,719		6,491	2049	88
89	2050		1,148,857				6,698		6,698		104,437			31,068	1,788,185	349,616	791,089	7,861	826,828	17,888	115,241	38,929	3,875,005	367,504	906,330	13,114		6,669		6,445	2050	89
90	2051		1,148,857				6,698		6,698		104,437			30,348	1,788,185	319,268	738,691	8,538	826,828	9,350	115,241	38,886	3,875,005	328,618	853,932	12,793		6,506		6,287	2051	90
91	2052		1,148,857				6,698		6,698		104,437			26,573	1,788,185	292,695	738,691	9,350	826,828		115,241	35,923	3,875,005	292,695	853,932	18,220		6,787	4,874	6,559	2052	91
92	2053		1,148,857				6,698		6,698		104,437			18,765	1,788,185	273,930	738,691		826,828		115,241	18,765	3,875,005	273,930	853,932	24,008		6,471	11,282	6,255	2053	92
93	2054		1,148,857				6,698		6,698		104,437			16,388	1,788,185	255,542	614,223		826,828		115,241	18,388	3,875,005	255,542	729,464	23,497		6,333	11,043	6,121	2054	93
94	2055		1,148,857				6,698		6,698		104,437			13,411	1,788,185	242,131	606,631		826,828		115,241	13,411	3,875,005	242,131	721,872	17,165		4,628	8,064	4,473	2055	94
95	2056